

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
12 June 2003 (12.06.2003)

PCT

(10) International Publication Number  
**WO 03/048304 A2**

- (51) International Patent Classification<sup>7</sup>: C12N
- (21) International Application Number: PCT/US02/36123
- (22) International Filing Date:  
25 November 2002 (25.11.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/333,777 29 November 2001 (29.11.2001) US  
60/426,742 18 November 2002 (18.11.2002) US
- (71) Applicant (*for all designated States except US*): **WYETH HOLDINGS CORPORATION** [US/US]; Five Giralda Farms, Madison, NJ 07940 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **FLETCHER, Leah, Diane** [US/US]; 25 Second Street, Geneseo, NY 14454 (US). **McMICHAEL, John, Calhoun** [US/US]; 186 Canterbury Road, Rochester, NY 14607 (US). **RUSSELL, David, Parrish** [US/US]; 240 North Pleasant Street, Canandaigua, NY 14424 (US). **ZAGURSKY, Robert, John** [US/US]; 569 Fox Hunt Drive, Victor, NY 14564 (US).
- (74) Agents: **CALNAN, William, H.** et al.; Wyeth, Patent Law Department, Five Giralda Farms, Madison, NJ 07940-0874 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
- *without international search report and to be republished upon receipt of that report*
  - *with sequence listing part of description published separately in electronic form and available upon request from the International Bureau*
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: ALLOIOCOCCUS OTTIDIS OPEN READING FRAMES (ORFs) ENCODING POLYPEPTIDE ANTIGENS, IMMUNOGENIC COMPOSITIONS AND USES THEREOF

(57) Abstract: The present invention relates to the complete genomic sequence of Gram-positive bacterium, *Alloiococcus otitidis*. The present invention also relates to polynucleotide sequences encoding polypeptides of *Alloiococcus otitidis*. In particular, the invention relates to antigenic polypeptides encoded by the *Alloiococcus otitidis* open reading frames (ORFs), and to their use in immunogenic compositions, therapeutics, diagnostics and the like.



WO 03/048304 A2

**ALLOIOCOCCUS OTITIDIS OPEN READING FRAMES (ORFs) ENCODING  
POLYPEPTIDE ANTIGENS, IMMUNOGENIC COMPOSITIONS AND USES THEREOF**

**FIELD OF THE INVENTION**

5           The present invention relates to the genomic sequence of *Alloiococcus otitidis*  
and polynucleotide sequences encoding polypeptides of the Gram-positive bacterium,  
*Alloiococcus otitidis*. The invention also relates to polynucleotides and polynucleotides  
encoding polypeptides, preferably antigenic polypeptides, encoded by the *Alloiococcus*  
10 *otitidis* open reading frames and the uses thereof.

**BACKGROUND OF THE INVENTION**

15           Otitis media, an inflammation of the middle ear, is the most frequent cause of  
visits to pediatricians' offices in the United States (Schappert, 1991). Approximately 80%  
of all children experience at least one episode of Otitis media by the age of three (Klein,  
1994). There are three main types of otitis media: Acute otitis media (AOM), otorrhea,  
and otitis media with effusion (OME). *Alloiococcus otitidis* has only been associated with  
otitis media with effusion (OME), but this may be due to the difficulty of its detection by  
20 standard bacterial culturing methods. Its detection in the effusions is likely due to the fact  
that the effusions are normally sterile and few or no competing bacterial species are  
isolated from them. Without the interference of a faster growing nasopharyngeal species,  
the culture plates are incubated for the longer duration needed to detect *Alloiococcus*  
*otitidis* colonies.

25           Three other bacterial species are commonly isolated from middle ear effusions.  
These are nontypable *Haemophilus influenzae*, *Moraxella catarrhalis*, and *Streptococcus*  
*pneumoniae*. One or more of these species have been found in one study to be  
associated with about 77% of all cases of OME using a PCR detection method (Post,  
2000). This study did not include assaying for *Alloiococcus otitidis*, so a portion of the  
30 unaccounted cases may be due to this organism.

          The bacterium *Alloiococcus otitidis* was first isolated from the middle ear fluids of  
10 children in the Buffalo, NY area with persistent OME and characterized as a large  
catalase negative, Gram-positive cocci that tend to occur in clumps, often in tetrads. It is  
slow growing and requires 2 to 5 days at 37°C before colonies are seen on sheep blood  
35 agar plates (Table 1). The bacterium was named *Alloiococcus otitis* by Aguirre and



Collins (1992), who showed that it was different from other known Gram-positive species based on its 16S rRNA sequence. Recently the bacterium's name has been changed from *Alloiococcus otitis* to *Alloiococcus otitidis* (Hendolin, et al. *Pediatr. Infect. Dis. J.* 18:860 (1999), Hendolin et al. *J. Clin. Microbiol.* 38:125 (2000)).

5 Several studies of the epidemiology *Alloiococcus otitidis* indicate it is associated with otitis media with effusion. These are summarized in Table 1. These studies have been carried out using both culture and PCR techniques. The number of cases detected by culture, as might be expected from the fastidious growth requirements of the bacterium, was less than the number detected by PCR. Assuming that the bacterium is  
10 detected more accurately by the PCR method, the bacterium is detected in between 10 and 50% of patients with OME. This frequency suggests that this organism represents a significant public health problem. Consequently, there is a need for immunogenic compositions to prevent symptoms caused by *Alloiococcus otitidis* infections. There is also a need for compositions for diagnosing *Alloiococcus otitidis* infections.

15

**TABLE 1: SUMMARY OF STUDIES INDICATING AN ASSOCIATION OF *ALLOIOCOCCUS OTITIDIS* WITH OTITIS MEDIA WITH EFFUSION (OME).**

% Detected	N <sup>a</sup>	Method	Reference
8	200	Culture	Faden & Dryja, <i>J. Clin. Microbiol.</i> 27:2488 (1989)
3	100	Culture	Sih et al., <i>ICAAC</i> (1992)
20	25	PCR	Hendolin et al., <i>J. Clin. Microbiol.</i> 35:2854 (1997)
50	12	PCR	Beswick, et al. <i>Lancet</i> 345:386 (1999)
42	67	PCR	Hendolin, et al. <i>Pediatr. Infect. Dis. J.</i> 18:860 (1999)
10	49	PCR	Hendolin et al. <i>J. Clin. Microbiol.</i> 38:125 (2000)

<sup>a</sup> Number of persons in study.

20

#### **SUMMARY OF THE INVENTION**

The present invention broadly relates to *Alloiococcus otitidis* genomic sequence. Particularly, the invention relates to newly identified polynucleotide open reading frames (ORFs) comprised within the genomic nucleotide sequence of *Alloiococcus otitidis*, and to polypeptides encoded by the ORFs. More particularly, the ORFs encode polypeptides  
25 that are surface localized, secreted, or exposed on *Alloiococcus otitidis*.

Thus, in certain aspects, the invention relates to *Alloiococcus otitidis* ORFs that

encode *Alloiococcus otitidis* polypeptides. In preferred embodiments, these *Alloiococcus otitidis* polypeptides are antigenic polypeptides. As defined hereinafter, an *Alloiococcus otitidis* antigenic polypeptide, antigen or immunogen, is an *Alloiococcus otitidis* polypeptide that is immunoreactive with an antibody or an *Alloiococcus otitidis* polypeptide that elicits an immune response. In other embodiments, the invention relates to the polynucleotides encoding these antigenic polypeptides. In other aspects, the invention relates to vectors comprising *Alloiococcus otitidis* ORFs and cells or animals transformed with these vectors. The invention relates also to methods of detecting these nucleic acids or polypeptides and kits for diagnosing *Alloiococcus otitidis* infection. The invention further relates to pharmaceutical compositions, in particular immunogenic compositions, for the prevention and/or treatment of bacterial infection, in particular *Alloiococcus otitidis*.

In a preferred embodiment, the immunogenic compositions are used for the treatment or prevention of non-systemic diseases, particularly of the Otitis media, which are induced or worsened by *Alloiococcus otitidis*.

In particular embodiments, the invention relates to an isolated polynucleotide of an *Alloiococcus otitidis* genomic sequence, wherein the polynucleotide comprises a nucleotide sequence having at least about 70% identity to a nucleotide sequence chosen from one of odd numbered sequences set out in SEQ ID NO: 1 through 6649, a degenerate variant thereof, or a fragment thereof. As defined hereinafter, a "degenerate variant" is defined as a polynucleotide that differs from the nucleotide sequence shown in SEQ ID NO:1 through SEQ ID NO:6649 (and fragments thereof) due to degeneracy of the genetic code, but still encodes the same *Alloiococcus otitidis* polypeptide (*i.e.*, SEQ ID NO:2 through SEQ ID NO:6650) as that encoded by the nucleotide sequence shown in SEQ ID NO:1 through SEQ ID NO:6649.

In other embodiments, the polynucleotide is a complement to a nucleotide sequence chosen from one of the odd numbered sequences set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a degenerate variant thereof, or a fragment thereof. In yet other embodiments, the polynucleotide is selected from the group consisting of genomic DNA, cDNA and RNA or may further comprise heterologous nucleotides.

In another embodiment, the invention comprises an isolated polynucleotide that hybridizes to a nucleotide sequence chosen from one of odd numbered sequences set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a complement hereof, a degenerate

variant thereof, or a fragment thereof, under high stringency hybridization conditions. In yet other embodiments, the polynucleotide hybridizes under intermediate stringency hybridization conditions.

In a preferred embodiment, an isolated polynucleotide of a an *Alloicoccus*  
 5 *otitidis* genomic sequence comprises a nucleotide sequence chosen from one of odd numbered sequences set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a fragment thereof, or a degenerate variant thereof, and encodes a polypeptide, a biological equivalent thereof, or a fragment thereof, selected from the group consisting of (a) an *Alloicoccus otitidis* polypeptide predicted by SignalP algorithm analysis as having met  
 10 all four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and a subset of these are predicted by HMM SignalP algorithm analysis as having a signal peptide; (b) an *Alloicoccus otitidis* polypeptide predicted by SignalP algorithm analysis as having met three of the four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and a subset of these predicted by HMM SignalP  
 15 algorithm analysis as having a signal peptide; (c) an *Alloicoccus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as having a signal peptide; (d) an *Alloicoccus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as being a non-secretory protein; (e) an *Alloicoccus otitidis* polypeptide identified by Pfam analysis; (f) an *Alloicoccus otitidis* polypeptide identified by BlastP analysis as being secreted,  
 20 surface exposed, vaccine candidate; (g) an *Alloicoccus otitidis* polypeptide identified using proteomics methodology as sharing homology with putative surface exposed proteins of *Streptococcus pneumoniae*; (h) an *Alloicoccus otitidis* polypeptide having a LPXTG motif, wherein the polypeptide is covalently attached to the peptidoglycan layer; (i) an *Alloicoccus otitidis* lipoprotein; (j) an *Alloicoccus otitidis* polypeptide non-  
 25 covalently associated with the peptidoglycan layer; (k) an *Alloicoccus otitidis* polypeptide having an RGDY motif wherein Y is not a proline residue; (l) an *Alloicoccus otitidis* polypeptide predicted by BlastP as being involved in capsule biosynthesis and transport; (m) an *Alloicoccus otitidis* polypeptide identified by BlastP as being localized within the capsule loci of the *Alloicoccus otitidis* genome; (n) an *Alloicoccus otitidis* polypeptide predicted by BlastP as being associated with sporulation; (o) an *Alloicoccus*  
 30 *otitidis* polypeptide encoded by unique ORFs identified by BlastP analysis as having a BlastP 'E Value' of  $> e^{-10}$ ; (p) an *Alloicoccus otitidis* polypeptide identified by Glimmer™ ORF finder program; (q) an *Alloicoccus otitidis* polypeptide identified by

GeneMark™ ORF finder program; (r) an *Alloiococcus otitidis* polypeptide identified by Applicants' assignee's ORF finder program that searches for an ATG, GTG or TTG Start codon between a Stop-Stop ORF; and (s) an *Alloiococcus otitidis* polypeptide identified by Applicants' assignee's ORF finder program that searches for a transmembrane domain between two Stop codons and a Start codon immediately upstream of this transmembrane region.

In one aspect of this embodiment, the polynucleotide is a complement to a nucleotide sequence selected from one of odd numbered sequences set out in SEQ ID NO: 1 and SEQ ID NO: 6649, a degenerate variant thereof, or a fragment thereof. In yet other aspects of this embodiment, the polynucleotide is selected from the group consisting of DNA, chromosomal DNA, cDNA and RNA or may further comprise heterologous nucleotides. In another aspect of the invention, the polynucleotide encodes a fusion polypeptide.

In a preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a polypeptide, which is predicted by SignalP algorithm analysis as having met all four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide, and the polynucleotide is selected from one of Seq. ID No. 89, Seq. ID No. 127, Seq. ID No. 131, Seq. ID No. 133, Seq. ID No. 161, Seq. ID No. 163, Seq. ID No. 213, Seq. ID No. 215, Seq. ID No. 225, Seq. ID No. 249, Seq. ID No. 251, Seq. ID No. 287, Seq. ID No. 289, Seq. ID No. 369, Seq. ID No. 371, Seq. ID No. 375, Seq. ID No. 377, Seq. ID No. 497, Seq. ID No. 503, Seq. ID No. 505, Seq. ID No. 527, Seq. ID No. 549, Seq. ID No. 575, Seq. ID No. 617, Seq. ID No. 657, Seq. ID No. 659, Seq. ID No. 661, Seq. ID No. 675, Seq. ID No. 715, Seq. ID No. 717, Seq. ID No. 745, Seq. ID No. 747, Seq. ID No. 755, Seq. ID No. 757, Seq. ID No. 759, Seq. ID No. 761, Seq. ID No. 773, Seq. ID No. 807, Seq. ID No. 967, Seq. ID No. 973, Seq. ID No. 975, Seq. ID No. 1013, Seq. ID No. 1025, Seq. ID No. 1027, Seq. ID No. 1039, Seq. ID No. 1075, Seq. ID No. 1089, Seq. ID No. 1195, Seq. ID No. 1197, Seq. ID No. 1207, Seq. ID No. 1239, Seq. ID No. 1243, Seq. ID No. 1245, Seq. ID No. 1269, Seq. ID No. 1315, Seq. ID No. 1317, Seq. ID No. 1331, Seq. ID No. 1365, Seq. ID No. 1367, Seq. ID No. 1369, Seq. ID No. 1445, Seq. ID No. 1447, Seq. ID No. 1513, Seq. ID No. 1517, Seq. ID No. 1545, Seq. ID No. 1549, Seq. ID No. 1561, Seq. ID No. 1569, Seq. ID No. 1571, Seq. ID No. 1585, Seq. ID No. 1643, Seq. ID No. 1653, Seq. ID No. 1661, Seq. ID No. 1663, Seq. ID No. 1707, Seq. ID No. 1733, Seq. ID No. 1737,

Seq. ID No. 1755, Seq. ID No. 1765, Seq. ID No. 1767, Seq. ID No. 1775, Seq. ID No. 1791, Seq. ID No. 1805, Seq. ID No. 1875, Seq. ID No. 1969, Seq. ID No. 1981, Seq. ID No. 2053, Seq. ID No. 2055, Seq. ID No. 2087, Seq. ID No. 2089, Seq. ID No. 2091, Seq. ID No. 2105, Seq. ID No. 2115, Seq. ID No. 2149, Seq. ID No. 2151, Seq. ID No. 2159, Seq. ID No. 2177, Seq. ID No. 2277, Seq. ID No. 2293, Seq. ID No. 2321, Seq. ID No. 2347, Seq. ID No. 2351, Seq. ID No. 2353, Seq. ID No. 2365, Seq. ID No. 2395, Seq. ID No. 2421, Seq. ID No. 2425, Seq. ID No. 2427, Seq. ID No. 2429, Seq. ID No. 2449, Seq. ID No. 2459, Seq. ID No. 2525, Seq. ID No. 2531, Seq. ID No. 2607, Seq. ID No. 2651, Seq. ID No. 2679, Seq. ID No. 2693, Seq. ID No. 2699, Seq. ID No. 2703, Seq. ID No. 2753, Seq. ID No. 2785, Seq. ID No. 2813, Seq. ID No. 2829, Seq. ID No. 2835, Seq. ID No. 2841, Seq. ID No. 2879, Seq. ID No. 2881, Seq. ID No. 2935, Seq. ID No. 2937, Seq. ID No. 2949, Seq. ID No. 2965, Seq. ID No. 2967, Seq. ID No. 2973, Seq. ID No. 3007, Seq. ID No. 3009, Seq. ID No. 3011, Seq. ID No. 3029, Seq. ID No. 3031, Seq. ID No. 3109, Seq. ID No. 3111, Seq. ID No. 3219, Seq. ID No. 3223, Seq. ID No. 3273, Seq. ID No. 3297, Seq. ID No. 3331, Seq. ID No. 3335, Seq. ID No. 3341, Seq. ID No. 3349, Seq. ID No. 3353, Seq. ID No. 3355, Seq. ID No. 3377, Seq. ID No. 3391, Seq. ID No. 3425, Seq. ID No. 3449, Seq. ID No. 3493, Seq. ID No. 3573, Seq. ID No. 3611, Seq. ID No. 3619, Seq. ID No. 3689, Seq. ID No. 3753, Seq. ID No. 3755, Seq. ID No. 3765, Seq. ID No. 3781, Seq. ID No. 3783, Seq. ID No. 3851, Seq. ID No. 3903, Seq. ID No. 4005, Seq. ID No. 4007, Seq. ID No. 4027, Seq. ID No. 4073, Seq. ID No. 4137, Seq. ID No. 4141, Seq. ID No. 4143, Seq. ID No. 4145, Seq. ID No. 4225, Seq. ID No. 4343, Seq. ID No. 4385, Seq. ID No. 4399, Seq. ID No. 4469, Seq. ID No. 4483, Seq. ID No. 4493, Seq. ID No. 4495, Seq. ID No. 4533, Seq. ID No. 4699, Seq. ID No. 4709, Seq. ID No. 4711, Seq. ID No. 4735, Seq. ID No. 4827, Seq. ID No. 4871, Seq. ID No. 4873, Seq. ID No. 4879, Seq. ID No. 4921, Seq. ID No. 4981, Seq. ID No. 5115, Seq. ID No. 5267, Seq. ID No. 5341, Seq. ID No. 5387, Seq. ID No. 5465, Seq. ID No. 5467, Seq. ID No. 5479, Seq. ID No. 5497, Seq. ID No. 5513, Seq. ID No. 5543, Seq. ID No. 5545, Seq. ID No. 5567, Seq. ID No. 5587, Seq. ID No. 5589, Seq. ID No. 5591, Seq. ID No. 5611, Seq. ID No. 5621, Seq. ID No. 5641, Seq. ID No. 5681, Seq. ID No. 5719, Seq. ID No. 5771, Seq. ID No. 5783, Seq. ID No. 5895, Seq. ID No. 5899, Seq. ID No. 5901, Seq. ID No. 5927, Seq. ID No. 5929, Seq. ID No. 5939, Seq. ID No. 5987, Seq. ID No. 6013, Seq. ID No. 6087, Seq. ID No. 6089, Seq. ID No. 6091, Seq. ID No. 6093, Seq. ID No. 6095, Seq. ID No. 6103, Seq. ID No. 6169, Seq. ID No. 6185,

Seq. ID No. 6187, Seq. ID No. 6195, Seq. ID No. 6197, Seq. ID No. 6203, Seq. ID No. 6205, Seq. ID No. 6221, Seq. ID No. 6223, Seq. ID No. 6229, Seq. ID No. 6291, Seq. ID No. 6415, Seq. ID No. 6417, Seq. ID No. 6473, Seq. ID No. 6507, Seq. ID No. 6543, Seq. ID No. 6595, Seq. ID No. 6597, Seq. ID No. 6599, Seq. ID No. 6601, and Seq. ID No. 6603.

In yet another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a polypeptide which is predicted by SignalP algorithm analysis as having met three of the four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and which is predicted by HMM Signal P algorithm analysis as having a signal peptide, and the polynucleotide is selected from one of Seq. ID No. 7, Seq. ID No. 11, Seq. ID No. 23, Seq. ID No. 45, Seq. ID No. 47, Seq. ID No. 53, Seq. ID No. 59, Seq. ID No. 65, Seq. ID No. 67, Seq. ID No. 87, Seq. ID No. 91, Seq. ID No. 139, Seq. ID No. 151, Seq. ID No. 159, Seq. ID No. 165, Seq. ID No. 169, Seq. ID No. 185, Seq. ID No. 211, Seq. ID No. 217, Seq. ID No. 235, Seq. ID No. 237, Seq. ID No. 239, Seq. ID No. 271, Seq. ID No. 285, Seq. ID No. 291, Seq. ID No. 327, Seq. ID No. 349, Seq. ID No. 385, Seq. ID No. 387, Seq. ID No. 407, Seq. ID No. 427, Seq. ID No. 431, Seq. ID No. 455, Seq. ID No. 457, Seq. ID No. 495, Seq. ID No. 499, Seq. ID No. 511, Seq. ID No. 513, Seq. ID No. 515, Seq. ID No. 525, Seq. ID No. 545, Seq. ID No. 547, Seq. ID No. 557, Seq. ID No. 569, Seq. ID No. 589, Seq. ID No. 591, Seq. ID No. 593, Seq. ID No. 595, Seq. ID No. 609, Seq. ID No. 637, Seq. ID No. 639, Seq. ID No. 641, Seq. ID No. 653, Seq. ID No. 669, Seq. ID No. 679, Seq. ID No. 719, Seq. ID No. 723, Seq. ID No. 739, Seq. ID No. 749, Seq. ID No. 751, Seq. ID No. 763, Seq. ID No. 765, Seq. ID No. 769, Seq. ID No. 777, Seq. ID No. 779, Seq. ID No. 781, Seq. ID No. 819, Seq. ID No. 895, Seq. ID No. 903, Seq. ID No. 905, Seq. ID No. 909, Seq. ID No. 935, Seq. ID No. 937, Seq. ID No. 951, Seq. ID No. 955, Seq. ID No. 979, Seq. ID No. 981, Seq. ID No. 983, Seq. ID No. 985, Seq. ID No. 1005, Seq. ID No. 1007, Seq. ID No. 1009, Seq. ID No. 1015, Seq. ID No. 1019, Seq. ID No. 1029, Seq. ID No. 1031, Seq. ID No. 1047, Seq. ID No. 1091, Seq. ID No. 1111, Seq. ID No. 1137, Seq. ID No. 1151, Seq. ID No. 1153, Seq. ID No. 1169, Seq. ID No. 1173, Seq. ID No. 1183, Seq. ID No. 1191, Seq. ID No. 1193, Seq. ID No. 1213, Seq. ID No. 1223, Seq. ID No. 1229, Seq. ID No. 1247, Seq. ID No. 1259, Seq. ID No. 1283, Seq. ID No. 1307, Seq. ID No. 1319, Seq. ID No. 1321, Seq. ID No. 1327, Seq. ID No. 1341, Seq. ID No. 1343, Seq. ID No. 1347, Seq. ID No. 1389, Seq. ID

No. 1401, Seq. ID No. 1429, Seq. ID No. 1479, Seq. ID No. 1551, Seq. ID No. 1559,  
Seq. ID No. 1579, Seq. ID No. 1587, Seq. ID No. 1621, Seq. ID No. 1627, Seq. ID No.  
1633, Seq. ID No. 1645, Seq. ID No. 1647, Seq. ID No. 1649, Seq. ID No. 1655, Seq. ID  
No. 1665, Seq. ID No. 1667, Seq. ID No. 1671, Seq. ID No. 1677, Seq. ID No. 1679,  
5 Seq. ID No. 1681, Seq. ID No. 1695, Seq. ID No. 1703, Seq. ID No. 1705, Seq. ID No.  
1731, Seq. ID No. 1753, Seq. ID No. 1759, Seq. ID No. 1763, Seq. ID No. 1787, Seq. ID  
No. 1797, Seq. ID No. 1821, Seq. ID No. 1823, Seq. ID No. 1833, Seq. ID No. 1839,  
Seq. ID No. 1841, Seq. ID No. 1843, Seq. ID No. 1893, Seq. ID No. 1917, Seq. ID No.  
1919, Seq. ID No. 1971, Seq. ID No. 1991, Seq. ID No. 2013, Seq. ID No. 2015, Seq. ID  
10 No. 2017, Seq. ID No. 2019, Seq. ID No. 2033, Seq. ID No. 2035, Seq. ID No. 2049,  
Seq. ID No. 2081, Seq. ID No. 2083, Seq. ID No. 2085, Seq. ID No. 2111, Seq. ID No.  
2113, Seq. ID No. 2123, Seq. ID No. 2125, Seq. ID No. 2127, Seq. ID No. 2131, Seq. ID  
No. 2133, Seq. ID No. 2153, Seq. ID No. 2161, Seq. ID No. 2171, Seq. ID No. 2175,  
Seq. ID No. 2179, Seq. ID No. 2187, Seq. ID No. 2201, Seq. ID No. 2203, Seq. ID No.  
15 2221, Seq. ID No. 2237, Seq. ID No. 2249, Seq. ID No. 2251, Seq. ID No. 2255, Seq. ID  
No. 2261, Seq. ID No. 2263, Seq. ID No. 2271, Seq. ID No. 2279, Seq. ID No. 2283,  
Seq. ID No. 2285, Seq. ID No. 2289, Seq. ID No. 2295, Seq. ID No. 2305, Seq. ID No.  
2307, Seq. ID No. 2317, Seq. ID No. 2319, Seq. ID No. 2323, Seq. ID No. 2325, Seq. ID  
No. 2343, Seq. ID No. 2349, Seq. ID No. 2385, Seq. ID No. 2393, Seq. ID No. 2423,  
20 Seq. ID No. 2453, Seq. ID No. 2491, Seq. ID No. 2497, Seq. ID No. 2499, Seq. ID No.  
2507, Seq. ID No. 2515, Seq. ID No. 2517, Seq. ID No. 2521, Seq. ID No. 2523, Seq. ID  
No. 2527, Seq. ID No. 2533, Seq. ID No. 2535, Seq. ID No. 2541, Seq. ID No. 2543,  
Seq. ID No. 2547, Seq. ID No. 2549, Seq. ID No. 2557, Seq. ID No. 2573, Seq. ID No.  
2583, Seq. ID No. 2601, Seq. ID No. 2603, Seq. ID No. 2621, Seq. ID No. 2653, Seq. ID  
25 No. 2681, Seq. ID No. 2691, Seq. ID No. 2701, Seq. ID No. 2733, Seq. ID No. 2739,  
Seq. ID No. 2801, Seq. ID No. 2807, Seq. ID No. 2815, Seq. ID No. 2819, Seq. ID No.  
2821, Seq. ID No. 2823, Seq. ID No. 2833, Seq. ID No. 2837, Seq. ID No. 2839, Seq. ID  
No. 2845, Seq. ID No. 2853, Seq. ID No. 2861, Seq. ID No. 2865, Seq. ID No. 2873,  
Seq. ID No. 2875, Seq. ID No. 2877, Seq. ID No. 2883, Seq. ID No. 2895, Seq. ID No.  
30 2905, Seq. ID No. 2939, Seq. ID No. 2941, Seq. ID No. 2947, Seq. ID No. 2981, Seq. ID  
No. 2983, Seq. ID No. 2987, Seq. ID No. 2991, Seq. ID No. 2995, Seq. ID No. 3001,  
Seq. ID No. 3005, Seq. ID No. 3021, Seq. ID No. 3025, Seq. ID No. 3043, Seq. ID No.  
3045, Seq. ID No. 3073, Seq. ID No. 3075, Seq. ID No. 3155, Seq. ID No. 3163, Seq. ID

No. 3165, Seq. ID No. 3167, Seq. ID No. 3183, Seq. ID No. 3213, Seq. ID No. 3215,  
Seq. ID No. 3235, Seq. ID No. 3245, Seq. ID No. 3261, Seq. ID No. 3263, Seq. ID No.  
3265, Seq. ID No. 3269, Seq. ID No. 3271, Seq. ID No. 3275, Seq. ID No. 3277, Seq. ID  
No. 3317, Seq. ID No. 3325, Seq. ID No. 3337, Seq. ID No. 3351, Seq. ID No. 3389,  
5 Seq. ID No. 3405, Seq. ID No. 3419, Seq. ID No. 3421, Seq. ID No. 3423, Seq. ID No.  
3451, Seq. ID No. 3453, Seq. ID No. 3455, Seq. ID No. 3491, Seq. ID No. 3495, Seq. ID  
No. 3503, Seq. ID No. 3505, Seq. ID No. 3517, Seq. ID No. 3519, Seq. ID No. 3545,  
Seq. ID No. 3547, Seq. ID No. 3571, Seq. ID No. 3593, Seq. ID No. 3617, Seq. ID No.  
3621, Seq. ID No. 3629, Seq. ID No. 3663, Seq. ID No. 3701, Seq. ID No. 3703, Seq. ID  
10 No. 3723, Seq. ID No. 3737, Seq. ID No. 3741, Seq. ID No. 3745, Seq. ID No. 3747,  
Seq. ID No. 3759, Seq. ID No. 3763, Seq. ID No. 3767, Seq. ID No. 3769, Seq. ID No.  
3771, Seq. ID No. 3785, Seq. ID No. 3793, Seq. ID No. 3813, Seq. ID No. 3837, Seq. ID  
No. 3839, Seq. ID No. 3861, Seq. ID No. 3865, Seq. ID No. 3889, Seq. ID No. 3891,  
Seq. ID No. 3895, Seq. ID No. 3915, Seq. ID No. 3923, Seq. ID No. 3925, Seq. ID No.  
15 3929, Seq. ID No. 3965, Seq. ID No. 3975, Seq. ID No. 3979, Seq. ID No. 3995, Seq. ID  
No. 3997, Seq. ID No. 4009, Seq. ID No. 4039, Seq. ID No. 4041, Seq. ID No. 4061,  
Seq. ID No. 4079, Seq. ID No. 4081, Seq. ID No. 4111, Seq. ID No. 4113, Seq. ID No.  
4135, Seq. ID No. 4139, Seq. ID No. 4155, Seq. ID No. 4181, Seq. ID No. 4203, Seq. ID  
No. 4221, Seq. ID No. 4247, Seq. ID No. 4253, Seq. ID No. 4257, Seq. ID No. 4259,  
20 Seq. ID No. 4261, Seq. ID No. 4263, Seq. ID No. 4269, Seq. ID No. 4311, Seq. ID No.  
4379, Seq. ID No. 4389, Seq. ID No. 4391, Seq. ID No. 4471, Seq. ID No. 4473, Seq. ID  
No. 4481, Seq. ID No. 4525, Seq. ID No. 4551, Seq. ID No. 4561, Seq. ID No. 4573,  
Seq. ID No. 4617, Seq. ID No. 4639, Seq. ID No. 4659, Seq. ID No. 4681, Seq. ID No.  
4701, Seq. ID No. 4705, Seq. ID No. 4713, Seq. ID No. 4717, Seq. ID No. 4721, Seq. ID  
25 No. 4737, Seq. ID No. 4741, Seq. ID No. 4813, Seq. ID No. 4817, Seq. ID No. 4819,  
Seq. ID No. 4829, Seq. ID No. 4831, Seq. ID No. 4851, Seq. ID No. 4869, Seq. ID No.  
4875, Seq. ID No. 4913, Seq. ID No. 4919, Seq. ID No. 4929, Seq. ID No. 4931, Seq. ID  
No. 4983, Seq. ID No. 4993, Seq. ID No. 5011, Seq. ID No. 5023, Seq. ID No. 5031,  
Seq. ID No. 5033, Seq. ID No. 5035, Seq. ID No. 5043, Seq. ID No. 5061, Seq. ID No.  
30 5063, Seq. ID No. 5069, Seq. ID No. 5103, Seq. ID No. 5121, Seq. ID No. 5123, Seq. ID  
No. 5131, Seq. ID No. 5133, Seq. ID No. 5135, Seq. ID No. 5137, Seq. ID No. 5139,  
Seq. ID No. 5141, Seq. ID No. 5151, Seq. ID No. 5159, Seq. ID No. 5161, Seq. ID No.  
5165, Seq. ID No. 5167, Seq. ID No. 5175, Seq. ID No. 5177, Seq. ID No. 5205, Seq. ID



No. 5207, Seq. ID No. 5211, Seq. ID No. 5215, Seq. ID No. 5219, Seq. ID No. 5223, Seq. ID No. 5285, Seq. ID No. 5287, Seq. ID No. 5329, Seq. ID No. 5331, Seq. ID No. 5377, Seq. ID No. 5379, Seq. ID No. 5381, Seq. ID No. 5385, Seq. ID No. 5405, Seq. ID No. 5407, Seq. ID No. 5453, Seq. ID No. 5459, Seq. ID No. 5461, Seq. ID No. 5463, Seq. ID No. 5481, Seq. ID No. 5509, Seq. ID No. 5529, Seq. ID No. 5531, Seq. ID No. 5557, Seq. ID No. 5569, Seq. ID No. 5577, Seq. ID No. 5623, Seq. ID No. 5625, Seq. ID No. 5643, Seq. ID No. 5659, Seq. ID No. 5661, Seq. ID No. 5683, Seq. ID No. 5685, Seq. ID No. 5709, Seq. ID No. 5711, Seq. ID No. 5733, Seq. ID No. 5739, Seq. ID No. 5765, Seq. ID No. 5797, Seq. ID No. 5827, Seq. ID No. 5889, Seq. ID No. 5893, Seq. ID No. 5905, Seq. ID No. 5909, Seq. ID No. 5911, Seq. ID No. 5923, Seq. ID No. 5963, Seq. ID No. 5965, Seq. ID No. 6025, Seq. ID No. 6027, Seq. ID No. 6031, Seq. ID No. 6043, Seq. ID No. 6045, Seq. ID No. 6047, Seq. ID No. 6053, Seq. ID No. 6059, Seq. ID No. 6109, Seq. ID No. 6111, Seq. ID No. 6115, Seq. ID No. 6117, Seq. ID No. 6127, Seq. ID No. 6131, Seq. ID No. 6135, Seq. ID No. 6137, Seq. ID No. 6161, Seq. ID No. 6165, Seq. ID No. 6183, Seq. ID No. 6189, Seq. ID No. 6191, Seq. ID No. 6193, Seq. ID No. 6207, Seq. ID No. 6209, Seq. ID No. 6217, Seq. ID No. 6225, Seq. ID No. 6235, Seq. ID No. 6243, Seq. ID No. 6249, Seq. ID No. 6253, Seq. ID No. 6259, Seq. ID No. 6265, Seq. ID No. 6267, Seq. ID No. 6275, Seq. ID No. 6283, Seq. ID No. 6285, Seq. ID No. 6303, Seq. ID No. 6325, Seq. ID No. 6327, Seq. ID No. 6363, Seq. ID No. 6365, Seq. ID No. 6367, Seq. ID No. 6385, Seq. ID No. 6425, Seq. ID No. 6427, Seq. ID No. 6429, Seq. ID No. 6431, Seq. ID No. 6453, Seq. ID No. 6465, Seq. ID No. 6469, Seq. ID No. 6471, Seq. ID No. 6479, Seq. ID No. 6539, Seq. ID No. 6541, Seq. ID No. 6571, Seq. ID No. 6573, Seq. ID No. 6639, Seq. ID No. 6643, and Seq. ID No. 6645.

In yet another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a polypeptide, which is predicted by HMM SignalP algorithm analysis as having a signal peptide, and the polynucleotide is selected from one of Seq. ID No. 3, Seq. ID No. 7, Seq. ID No. 9, Seq. ID No. 19, Seq. ID No. 21, Seq. ID No. 31, Seq. ID No. 33, Seq. ID No. 45, Seq. ID No. 47, Seq. ID No. 49, Seq. ID No. 53, Seq. ID No. 65, Seq. ID No. 67, Seq. ID No. 85, Seq. ID No. 87, Seq. ID No. 105, Seq. ID No. 111, Seq. ID No. 123, Seq. ID No. 131, Seq. ID No. 133, Seq. ID No. 141, Seq. ID No. 159, Seq. ID No. 161, Seq. ID No. 163, Seq. ID No. 171, Seq. ID No. 191, Seq. ID No. 209, Seq. ID No. 211, Seq. ID No. 213, Seq. ID No. 215, Seq. ID No. 217, Seq. ID No. 225, Seq. ID No. 235, Seq. ID No. 237,

Seq. ID No. 249, Seq. ID No. 251, Seq. ID No. 255, Seq. ID No. 257, Seq. ID No. 259,  
Seq. ID No. 271, Seq. ID No. 273, Seq. ID No. 277, Seq. ID No. 285, Seq. ID No. 287,  
Seq. ID No. 289, Seq. ID No. 327, Seq. ID No. 329, Seq. ID No. 357, Seq. ID No. 359,  
Seq. ID No. 373, Seq. ID No. 375, Seq. ID No. 393, Seq. ID No. 401, Seq. ID No. 403,  
5 Seq. ID No. 455, Seq. ID No. 457, Seq. ID No. 477, Seq. ID No. 487, Seq. ID No. 489,  
Seq. ID No. 491, Seq. ID No. 493, Seq. ID No. 495, Seq. ID No. 497, Seq. ID No. 499,  
Seq. ID No. 503, Seq. ID No. 505, Seq. ID No. 509, Seq. ID No. 511, Seq. ID No. 513,  
Seq. ID No. 515, Seq. ID No. 525, Seq. ID No. 527, Seq. ID No. 545, Seq. ID No. 547,  
Seq. ID No. 549, Seq. ID No. 557, Seq. ID No. 567, Seq. ID No. 569, Seq. ID No. 575,  
10 Seq. ID No. 577, Seq. ID No. 579, Seq. ID No. 591, Seq. ID No. 593, Seq. ID No. 599,  
Seq. ID No. 617, Seq. ID No. 637, Seq. ID No. 639, Seq. ID No. 641, Seq. ID No. 643,  
Seq. ID No. 645, Seq. ID No. 647, Seq. ID No. 653, Seq. ID No. 655, Seq. ID No. 657,  
Seq. ID No. 659, Seq. ID No. 661, Seq. ID No. 667, Seq. ID No. 669, Seq. ID No. 675,  
Seq. ID No. 677, Seq. ID No. 679, Seq. ID No. 715, Seq. ID No. 717, Seq. ID No. 719,  
15 Seq. ID No. 721, Seq. ID No. 723, Seq. ID No. 725, Seq. ID No. 745, Seq. ID No. 747,  
Seq. ID No. 749, Seq. ID No. 751, Seq. ID No. 755, Seq. ID No. 757, Seq. ID No. 759,  
Seq. ID No. 761, Seq. ID No. 763, Seq. ID No. 765, Seq. ID No. 769, Seq. ID No. 777,  
Seq. ID No. 779, Seq. ID No. 781, Seq. ID No. 807, Seq. ID No. 809, Seq. ID No. 819,  
Seq. ID No. 825, Seq. ID No. 863, Seq. ID No. 893, Seq. ID No. 901, Seq. ID No. 935,  
20 Seq. ID No. 937, Seq. ID No. 941, Seq. ID No. 943, Seq. ID No. 955, Seq. ID No. 957,  
Seq. ID No. 967, Seq. ID No. 979, Seq. ID No. 981, Seq. ID No. 983, Seq. ID No. 985,  
Seq. ID No. 1001, Seq. ID No. 1003, Seq. ID No. 1005, Seq. ID No. 1007, Seq. ID No.  
1009, Seq. ID No. 1011, Seq. ID No. 1013, Seq. ID No. 1015, Seq. ID No. 1019, Seq. ID  
No. 1029, Seq. ID No. 1031, Seq. ID No. 1033, Seq. ID No. 1035, Seq. ID No. 1037,  
25 Seq. ID No. 1039, Seq. ID No. 1045, Seq. ID No. 1055, Seq. ID No. 1075, Seq. ID No.  
1077, Seq. ID No. 1105, Seq. ID No. 1107, Seq. ID No. 1131, Seq. ID No. 1135, Seq. ID  
No. 1137, Seq. ID No. 1139, Seq. ID No. 1151, Seq. ID No. 1165, Seq. ID No. 1167,  
Seq. ID No. 1169, Seq. ID No. 1173, Seq. ID No. 1183, Seq. ID No. 1195, Seq. ID No.  
1197, Seq. ID No. 1203, Seq. ID No. 1213, Seq. ID No. 1223, Seq. ID No. 1227, Seq. ID  
30 No. 1229, Seq. ID No. 1237, Seq. ID No. 1243, Seq. ID No. 1245, Seq. ID No. 1259,  
Seq. ID No. 1265, Seq. ID No. 1267, Seq. ID No. 1269, Seq. ID No. 1271, Seq. ID No.  
1283, Seq. ID No. 1287, Seq. ID No. 1289, Seq. ID No. 1291, Seq. ID No. 1295, Seq. ID  
No. 1297, Seq. ID No. 1303, Seq. ID No. 1305, Seq. ID No. 1315, Seq. ID No. 1317,

Seq. ID No. 1319, Seq. ID No. 1325, Seq. ID No. 1327, Seq. ID No. 1329, Seq. ID No. 1331, Seq. ID No. 1337, Seq. ID No. 1341, Seq. ID No. 1343, Seq. ID No. 1347, Seq. ID No. 1349, Seq. ID No. 1351, Seq. ID No. 1353, Seq. ID No. 1365, Seq. ID No. 1367, Seq. ID No. 1369, Seq. ID No. 1371, Seq. ID No. 1381, Seq. ID No. 1401, Seq. ID No. 1429, Seq. ID No. 1435, Seq. ID No. 1445, Seq. ID No. 1447, Seq. ID No. 1481, Seq. ID No. 1513, Seq. ID No. 1515, Seq. ID No. 1517, Seq. ID No. 1529, Seq. ID No. 1533, Seq. ID No. 1535, Seq. ID No. 1545, Seq. ID No. 1547, Seq. ID No. 1551, Seq. ID No. 1553, Seq. ID No. 1559, Seq. ID No. 1561, Seq. ID No. 1563, Seq. ID No. 1571, Seq. ID No. 1579, Seq. ID No. 1583, Seq. ID No. 1585, Seq. ID No. 1621, Seq. ID No. 1633, Seq. ID No. 1639, Seq. ID No. 1643, Seq. ID No. 1645, Seq. ID No. 1647, Seq. ID No. 1649, Seq. ID No. 1653, Seq. ID No. 1661, Seq. ID No. 1663, Seq. ID No. 1665, Seq. ID No. 1671, Seq. ID No. 1673, Seq. ID No. 1677, Seq. ID No. 1679, Seq. ID No. 1681, Seq. ID No. 1693, Seq. ID No. 1707, Seq. ID No. 1711, Seq. ID No. 1731, Seq. ID No. 1733, Seq. ID No. 1737, Seq. ID No. 1753, Seq. ID No. 1755, Seq. ID No. 1757, Seq. ID No. 1765, Seq. ID No. 1767, Seq. ID No. 1771, Seq. ID No. 1781, Seq. ID No. 1787, Seq. ID No. 1791, Seq. ID No. 1797, Seq. ID No. 1805, Seq. ID No. 1819, Seq. ID No. 1821, Seq. ID No. 1823, Seq. ID No. 1839, Seq. ID No. 1857, Seq. ID No. 1869, Seq. ID No. 1875, Seq. ID No. 1891, Seq. ID No. 1893, Seq. ID No. 1895, Seq. ID No. 1915, Seq. ID No. 1917, Seq. ID No. 1919, Seq. ID No. 1923, Seq. ID No. 1927, Seq. ID No. 1929, Seq. ID No. 1969, Seq. ID No. 1981, Seq. ID No. 1991, Seq. ID No. 1993, Seq. ID No. 2005, Seq. ID No. 2013, Seq. ID No. 2017, Seq. ID No. 2019, Seq. ID No. 2025, Seq. ID No. 2027, Seq. ID No. 2033, Seq. ID No. 2035, Seq. ID No. 2041, Seq. ID No. 2049, Seq. ID No. 2053, Seq. ID No. 2055, Seq. ID No. 2087, Seq. ID No. 2089, Seq. ID No. 2091, Seq. ID No. 2105, Seq. ID No. 2107, Seq. ID No. 2109, Seq. ID No. 2113, Seq. ID No. 2115, Seq. ID No. 2121, Seq. ID No. 2123, Seq. ID No. 2125, Seq. ID No. 2127, Seq. ID No. 2149, Seq. ID No. 2151, Seq. ID No. 2155, Seq. ID No. 2157, Seq. ID No. 2159, Seq. ID No. 2171, Seq. ID No. 2173, Seq. ID No. 2177, Seq. ID No. 2187, Seq. ID No. 2191, Seq. ID No. 2205, Seq. ID No. 2237, Seq. ID No. 2239, Seq. ID No. 2245, Seq. ID No. 2249, Seq. ID No. 2251, Seq. ID No. 2255, Seq. ID No. 2259, Seq. ID No. 2271, Seq. ID No. 2283, Seq. ID No. 2289, Seq. ID No. 2291, Seq. ID No. 2293, Seq. ID No. 2295, Seq. ID No. 2303, Seq. ID No. 2305, Seq. ID No. 2307, Seq. ID No. 2317, Seq. ID No. 2319, Seq. ID No. 2321, Seq. ID No. 2323, Seq. ID No. 2325, Seq. ID No. 2327, Seq. ID No. 2329, Seq. ID No. 2333, Seq. ID No. 2343, Seq. ID No. 2347,

Seq. ID No. 2349, Seq. ID No. 2351, Seq. ID No. 2353, Seq. ID No. 2355, Seq. ID No. 2357, Seq. ID No. 2365, Seq. ID No. 2367, Seq. ID No. 2371, Seq. ID No. 2375, Seq. ID No. 2387, Seq. ID No. 2389, Seq. ID No. 2391, Seq. ID No. 2393, Seq. ID No. 2407, Seq. ID No. 2419, Seq. ID No. 2421, Seq. ID No. 2425, Seq. ID No. 2427, Seq. ID No. 2429, Seq. ID No. 2433, Seq. ID No. 2449, Seq. ID No. 2459, Seq. ID No. 2487, Seq. ID No. 2489, Seq. ID No. 2491, Seq. ID No. 2493, Seq. ID No. 2497, Seq. ID No. 2499, Seq. ID No. 2501, Seq. ID No. 2503, Seq. ID No. 2507, Seq. ID No. 2515, Seq. ID No. 2517, Seq. ID No. 2523, Seq. ID No. 2525, Seq. ID No. 2527, Seq. ID No. 2531, Seq. ID No. 2533, Seq. ID No. 2535, Seq. ID No. 2537, Seq. ID No. 2541, Seq. ID No. 2543, Seq. ID No. 2545, Seq. ID No. 2555, Seq. ID No. 2557, Seq. ID No. 2565, Seq. ID No. 2569, Seq. ID No. 2571, Seq. ID No. 2583, Seq. ID No. 2591, Seq. ID No. 2597, Seq. ID No. 2599, Seq. ID No. 2601, Seq. ID No. 2607, Seq. ID No. 2611, Seq. ID No. 2621, Seq. ID No. 2627, Seq. ID No. 2629, Seq. ID No. 2651, Seq. ID No. 2679, Seq. ID No. 2681, Seq. ID No. 2683, Seq. ID No. 2691, Seq. ID No. 2693, Seq. ID No. 2695, Seq. ID No. 2697, Seq. ID No. 2699, Seq. ID No. 2701, Seq. ID No. 2703, Seq. ID No. 2705, Seq. ID No. 2707, Seq. ID No. 2717, Seq. ID No. 2729, Seq. ID No. 2731, Seq. ID No. 2733, Seq. ID No. 2783, Seq. ID No. 2785, Seq. ID No. 2801, Seq. ID No. 2809, Seq. ID No. 2813, Seq. ID No. 2815, Seq. ID No. 2819, Seq. ID No. 2821, Seq. ID No. 2823, Seq. ID No. 2831, Seq. ID No. 2833, Seq. ID No. 2835, Seq. ID No. 2837, Seq. ID No. 2839, Seq. ID No. 2841, Seq. ID No. 2845, Seq. ID No. 2853, Seq. ID No. 2855, Seq. ID No. 2859, Seq. ID No. 2861, Seq. ID No. 2873, Seq. ID No. 2881, Seq. ID No. 2893, Seq. ID No. 2905, Seq. ID No. 2935, Seq. ID No. 2937, Seq. ID No. 2939, Seq. ID No. 2941, Seq. ID No. 2947, Seq. ID No. 2949, Seq. ID No. 2951, Seq. ID No. 2969, Seq. ID No. 2973, Seq. ID No. 2975, Seq. ID No. 2977, Seq. ID No. 2981, Seq. ID No. 2983, Seq. ID No. 2987, Seq. ID No. 2991, Seq. ID No. 2995, Seq. ID No. 2997, Seq. ID No. 3005, Seq. ID No. 3007, Seq. ID No. 3009, Seq. ID No. 3011, Seq. ID No. 3013, Seq. ID No. 3023, Seq. ID No. 3025, Seq. ID No. 3027, Seq. ID No. 3029, Seq. ID No. 3031, Seq. ID No. 3043, Seq. ID No. 3055, Seq. ID No. 3063, Seq. ID No. 3071, Seq. ID No. 3073, Seq. ID No. 3075, Seq. ID No. 3077, Seq. ID No. 3119, Seq. ID No. 3121, Seq. ID No. 3123, Seq. ID No. 3145, Seq. ID No. 3155, Seq. ID No. 3157, Seq. ID No. 3163, Seq. ID No. 3165, Seq. ID No. 3173, Seq. ID No. 3183, Seq. ID No. 3193, Seq. ID No. 3201, Seq. ID No. 3213, Seq. ID No. 3215, Seq. ID No. 3217, Seq. ID No. 3219, Seq. ID No. 3241, Seq. ID No. 3243, Seq. ID No. 3245, Seq. ID No. 3249, Seq. ID No. 3255,

Seq. ID No. 3257, Seq. ID No. 3261, Seq. ID No. 3263, Seq. ID No. 3269, Seq. ID No. 3275, Seq. ID No. 3277, Seq. ID No. 3297, Seq. ID No. 3317, Seq. ID No. 3323, Seq. ID No. 3325, Seq. ID No. 3331, Seq. ID No. 3335, Seq. ID No. 3337, Seq. ID No. 3339, Seq. ID No. 3349, Seq. ID No. 3351, Seq. ID No. 3353, Seq. ID No. 3355, Seq. ID No. 3357, Seq. ID No. 3359, Seq. ID No. 3375, Seq. ID No. 3377, Seq. ID No. 3389, Seq. ID No. 3391, Seq. ID No. 3395, Seq. ID No. 3405, Seq. ID No. 3415, Seq. ID No. 3421, Seq. ID No. 3425, Seq. ID No. 3427, Seq. ID No. 3433, Seq. ID No. 3441, Seq. ID No. 3449, Seq. ID No. 3451, Seq. ID No. 3453, Seq. ID No. 3455, Seq. ID No. 3457, Seq. ID No. 3463, Seq. ID No. 3481, Seq. ID No. 3491, Seq. ID No. 3493, Seq. ID No. 3503, Seq. ID No. 3505, Seq. ID No. 3517, Seq. ID No. 3519, Seq. ID No. 3527, Seq. ID No. 3531, Seq. ID No. 3539, Seq. ID No. 3561, Seq. ID No. 3573, Seq. ID No. 3581, Seq. ID No. 3587, Seq. ID No. 3593, Seq. ID No. 3595, Seq. ID No. 3611, Seq. ID No. 3617, Seq. ID No. 3619, Seq. ID No. 3621, Seq. ID No. 3625, Seq. ID No. 3629, Seq. ID No. 3635, Seq. ID No. 3677, Seq. ID No. 3679, Seq. ID No. 3689, Seq. ID No. 3717, Seq. ID No. 3723, Seq. ID No. 3727, Seq. ID No. 3741, Seq. ID No. 3745, Seq. ID No. 3753, Seq. ID No. 3755, Seq. ID No. 3757, Seq. ID No. 3761, Seq. ID No. 3763, Seq. ID No. 3765, Seq. ID No. 3781, Seq. ID No. 3783, Seq. ID No. 3793, Seq. ID No. 3799, Seq. ID No. 3807, Seq. ID No. 3813, Seq. ID No. 3815, Seq. ID No. 3817, Seq. ID No. 3837, Seq. ID No. 3839, Seq. ID No. 3849, Seq. ID No. 3851, Seq. ID No. 3853, Seq. ID No. 3859, Seq. ID No. 3861, Seq. ID No. 3863, Seq. ID No. 3865, Seq. ID No. 3879, Seq. ID No. 3889, Seq. ID No. 3891, Seq. ID No. 3895, Seq. ID No. 3903, Seq. ID No. 3915, Seq. ID No. 3923, Seq. ID No. 3925, Seq. ID No. 3959, Seq. ID No. 3963, Seq. ID No. 3973, Seq. ID No. 3975, Seq. ID No. 3993, Seq. ID No. 3995, Seq. ID No. 3997, Seq. ID No. 4005, Seq. ID No. 4007, Seq. ID No. 4009, Seq. ID No. 4025, Seq. ID No. 4027, Seq. ID No. 4039, Seq. ID No. 4041, Seq. ID No. 4043, Seq. ID No. 4045, Seq. ID No. 4047, Seq. ID No. 4049, Seq. ID No. 4061, Seq. ID No. 4071, Seq. ID No. 4073, Seq. ID No. 4079, Seq. ID No. 4081, Seq. ID No. 4083, Seq. ID No. 4101, Seq. ID No. 4103, Seq. ID No. 4111, Seq. ID No. 4133, Seq. ID No. 4135, Seq. ID No. 4137, Seq. ID No. 4139, Seq. ID No. 4141, Seq. ID No. 4143, Seq. ID No. 4145, Seq. ID No. 4151, Seq. ID No. 4153, Seq. ID No. 4181, Seq. ID No. 4221, Seq. ID No. 4223, Seq. ID No. 4225, Seq. ID No. 4227, Seq. ID No. 4231, Seq. ID No. 4233, Seq. ID No. 4241, Seq. ID No. 4247, Seq. ID No. 4253, Seq. ID No. 4257, Seq. ID No. 4259, Seq. ID No. 4261, Seq. ID No. 4263, Seq. ID No. 4265, Seq. ID No. 4269, Seq. ID No. 4275, Seq. ID No. 4285,

Seq. ID No. 4287, Seq. ID No. 4297, Seq. ID No. 4307, Seq. ID No. 4311, Seq. ID No. 4313, Seq. ID No. 4343, Seq. ID No. 4379, Seq. ID No. 4385, Seq. ID No. 4389, Seq. ID No. 4391, Seq. ID No. 4399, Seq. ID No. 4403, Seq. ID No. 4437, Seq. ID No. 4439, Seq. ID No. 4441, Seq. ID No. 4469, Seq. ID No. 4473, Seq. ID No. 4481, Seq. ID No. 4483, Seq. ID No. 4485, Seq. ID No. 4493, Seq. ID No. 4495, Seq. ID No. 4497, Seq. ID No. 4513, Seq. ID No. 4515, Seq. ID No. 4527, Seq. ID No. 4529, Seq. ID No. 4533, Seq. ID No. 4587, Seq. ID No. 4589, Seq. ID No. 4639, Seq. ID No. 4641, Seq. ID No. 4643, Seq. ID No. 4659, Seq. ID No. 4681, Seq. ID No. 4687, Seq. ID No. 4695, Seq. ID No. 4705, Seq. ID No. 4707, Seq. ID No. 4709, Seq. ID No. 4711, Seq. ID No. 4715, Seq. ID No. 4717, Seq. ID No. 4737, Seq. ID No. 4759, Seq. ID No. 4813, Seq. ID No. 4827, Seq. ID No. 4853, Seq. ID No. 4863, Seq. ID No. 4869, Seq. ID No. 4871, Seq. ID No. 4873, Seq. ID No. 4875, Seq. ID No. 4919, Seq. ID No. 4921, Seq. ID No. 4923, Seq. ID No. 4929, Seq. ID No. 4931, Seq. ID No. 4949, Seq. ID No. 4951, Seq. ID No. 4975, Seq. ID No. 4987, Seq. ID No. 4999, Seq. ID No. 5013, Seq. ID No. 5031, Seq. ID No. 5061, Seq. ID No. 5063, Seq. ID No. 5069, Seq. ID No. 5085, Seq. ID No. 5103, Seq. ID No. 5115, Seq. ID No. 5123, Seq. ID No. 5125, Seq. ID No. 5129, Seq. ID No. 5131, Seq. ID No. 5133, Seq. ID No. 5135, Seq. ID No. 5137, Seq. ID No. 5139, Seq. ID No. 5141, Seq. ID No. 5159, Seq. ID No. 5165, Seq. ID No. 5175, Seq. ID No. 5197, Seq. ID No. 5199, Seq. ID No. 5205, Seq. ID No. 5207, Seq. ID No. 5213, Seq. ID No. 5219, Seq. ID No. 5223, Seq. ID No. 5267, Seq. ID No. 5273, Seq. ID No. 5275, Seq. ID No. 5277, Seq. ID No. 5279, Seq. ID No. 5281, Seq. ID No. 5285, Seq. ID No. 5327, Seq. ID No. 5329, Seq. ID No. 5331, Seq. ID No. 5341, Seq. ID No. 5377, Seq. ID No. 5379, Seq. ID No. 5385, Seq. ID No. 5387, Seq. ID No. 5405, Seq. ID No. 5413, Seq. ID No. 5415, Seq. ID No. 5433, Seq. ID No. 5453, Seq. ID No. 5459, Seq. ID No. 5461, Seq. ID No. 5463, Seq. ID No. 5465, Seq. ID No. 5491, Seq. ID No. 5497, Seq. ID No. 5509, Seq. ID No. 5513, Seq. ID No. 5515, Seq. ID No. 5517, Seq. ID No. 5525, Seq. ID No. 5529, Seq. ID No. 5531, Seq. ID No. 5533, Seq. ID No. 5543, Seq. ID No. 5545, Seq. ID No. 5569, Seq. ID No. 5587, Seq. ID No. 5589, Seq. ID No. 5591, Seq. ID No. 5593, Seq. ID No. 5595, Seq. ID No. 5597, Seq. ID No. 5609, Seq. ID No. 5611, Seq. ID No. 5621, Seq. ID No. 5623, Seq. ID No. 5625, Seq. ID No. 5633, Seq. ID No. 5637, Seq. ID No. 5639, Seq. ID No. 5641, Seq. ID No. 5643, Seq. ID No. 5649, Seq. ID No. 5659, Seq. ID No. 5667, Seq. ID No. 5681, Seq. ID No. 5683, Seq. ID No. 5685, Seq. ID No. 5687, Seq. ID No. 5689, Seq. ID No. 5699, Seq. ID No. 5703, Seq. ID No. 5705,

Seq. ID No. 5709, Seq. ID No. 5711, Seq. ID No. 5719, Seq. ID No. 5729, Seq. ID No. 5733, Seq. ID No. 5735, Seq. ID No. 5739, Seq. ID No. 5763, Seq. ID No. 5765, Seq. ID No. 5767, Seq. ID No. 5771, Seq. ID No. 5783, Seq. ID No. 5785, Seq. ID No. 5791, Seq. ID No. 5797, Seq. ID No. 5829, Seq. ID No. 5879, Seq. ID No. 5883, Seq. ID No. 5885, Seq. ID No. 5889, Seq. ID No. 5893, Seq. ID No. 5895, Seq. ID No. 5899, Seq. ID No. 5901, Seq. ID No. 5905, Seq. ID No. 5909, Seq. ID No. 5921, Seq. ID No. 5923, Seq. ID No. 5927, Seq. ID No. 5929, Seq. ID No. 5939, Seq. ID No. 6023, Seq. ID No. 6025, Seq. ID No. 6027, Seq. ID No. 6043, Seq. ID No. 6047, Seq. ID No. 6053, Seq. ID No. 6059, Seq. ID No. 6063, Seq. ID No. 6067, Seq. ID No. 6087, Seq. ID No. 6089, Seq. ID No. 6091, Seq. ID No. 6095, Seq. ID No. 6103, Seq. ID No. 6107, Seq. ID No. 6109, Seq. ID No. 6111, Seq. ID No. 6115, Seq. ID No. 6117, Seq. ID No. 6135, Seq. ID No. 6137, Seq. ID No. 6159, Seq. ID No. 6161, Seq. ID No. 6163, Seq. ID No. 6165, Seq. ID No. 6169, Seq. ID No. 6183, Seq. ID No. 6185, Seq. ID No. 6187, Seq. ID No. 6189, Seq. ID No. 6191, Seq. ID No. 6197, Seq. ID No. 6203, Seq. ID No. 6205, Seq. ID No. 6209, Seq. ID No. 6217, Seq. ID No. 6221, Seq. ID No. 6223, Seq. ID No. 6225, Seq. ID No. 6227, Seq. ID No. 6229, Seq. ID No. 6235, Seq. ID No. 6237, Seq. ID No. 6241, Seq. ID No. 6243, Seq. ID No. 6245, Seq. ID No. 6249, Seq. ID No. 6253, Seq. ID No. 6259, Seq. ID No. 6263, Seq. ID No. 6265, Seq. ID No. 6267, Seq. ID No. 6273, Seq. ID No. 6275, Seq. ID No. 6283, Seq. ID No. 6285, Seq. ID No. 6289, Seq. ID No. 6301, Seq. ID No. 6303, Seq. ID No. 6325, Seq. ID No. 6327, Seq. ID No. 6363, Seq. ID No. 6365, Seq. ID No. 6377, Seq. ID No. 6381, Seq. ID No. 6383, Seq. ID No. 6415, Seq. ID No. 6425, Seq. ID No. 6427, Seq. ID No. 6429, Seq. ID No. 6431, Seq. ID No. 6473, Seq. ID No. 6479, Seq. ID No. 6497, Seq. ID No. 6517, Seq. ID No. 6541, Seq. ID No. 6543, Seq. ID No. 6555, Seq. ID No. 6557, Seq. ID No. 6571, Seq. ID No. 6573, Seq. ID No. 6581, Seq. ID No. 6593, Seq. ID No. 6595, Seq. ID No. 6597, Seq. ID No. 6599, Seq. ID No. 6601, Seq. ID No. 6603, Seq. ID No. 6631, Seq. ID No. 6637, Seq. ID No. 6639, Seq. ID No. 6643, Seq. ID No. 6645, and Seq. ID No. 6649.

In still yet another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a polypeptide, which is predicted by HMM SignalP algorithm analysis as being a non-secretory protein, and the polypeptide is selected from Seq. ID No. 1, Seq. ID No. 5, Seq. ID No. 11, Seq. ID No. 13, Seq. ID No. 15, Seq. ID No. 17, Seq. ID No. 23, Seq. ID No. 25, Seq. ID No. 27, Seq. ID No. 29, Seq. ID No. 35, Seq. ID No. 37, Seq. ID No. 39, Seq. ID No. 41, Seq.

ID No. 43, Seq. ID No. 51, Seq. ID No. 55, Seq. ID No. 57, Seq. ID No. 59, Seq. ID No. 61, Seq. ID No. 63, Seq. ID No. 69, Seq. ID No. 71, Seq. ID No. 73, Seq. ID No. 75, Seq. ID No. 77, Seq. ID No. 79, Seq. ID No. 81, Seq. ID No. 83, Seq. ID No. 89, Seq. ID No. 91, Seq. ID No. 93, Seq. ID No. 95, Seq. ID No. 97, Seq. ID No. 99, Seq. ID No. 101, Seq. ID No. 103, Seq. ID No. 107, Seq. ID No. 109, Seq. ID No. 113, Seq. ID No. 115, Seq. ID No. 117, Seq. ID No. 119, Seq. ID No. 121, Seq. ID No. 125, Seq. ID No. 127, Seq. ID No. 129, Seq. ID No. 135, Seq. ID No. 137, Seq. ID No. 139, Seq. ID No. 143, Seq. ID No. 145, Seq. ID No. 147, Seq. ID No. 149, Seq. ID No. 151, Seq. ID No. 153, Seq. ID No. 155, Seq. ID No. 157, Seq. ID No. 165, Seq. ID No. 167, Seq. ID No. 169, Seq. ID No. 173, Seq. ID No. 175, Seq. ID No. 177, Seq. ID No. 179, Seq. ID No. 181, Seq. ID No. 183, Seq. ID No. 185, Seq. ID No. 187, Seq. ID No. 189, Seq. ID No. 193, Seq. ID No. 195, Seq. ID No. 197, Seq. ID No. 199, Seq. ID No. 201, Seq. ID No. 203, Seq. ID No. 205, Seq. ID No. 207, Seq. ID No. 219, Seq. ID No. 221, Seq. ID No. 223, Seq. ID No. 227, Seq. ID No. 229, Seq. ID No. 231, Seq. ID No. 233, Seq. ID No. 239, Seq. ID No. 241, Seq. ID No. 243, Seq. ID No. 245, Seq. ID No. 247, Seq. ID No. 253, Seq. ID No. 261, Seq. ID No. 263, Seq. ID No. 265, Seq. ID No. 267, Seq. ID No. 269, Seq. ID No. 275, Seq. ID No. 279, Seq. ID No. 281, Seq. ID No. 283, Seq. ID No. 291, Seq. ID No. 293, Seq. ID No. 295, Seq. ID No. 297, Seq. ID No. 299, Seq. ID No. 301, Seq. ID No. 303, Seq. ID No. 305, Seq. ID No. 307, Seq. ID No. 309, Seq. ID No. 311, Seq. ID No. 313, Seq. ID No. 315, Seq. ID No. 317, Seq. ID No. 319, Seq. ID No. 321, Seq. ID No. 323, Seq. ID No. 325, Seq. ID No. 331, Seq. ID No. 333, Seq. ID No. 335, Seq. ID No. 337, Seq. ID No. 339, Seq. ID No. 341, Seq. ID No. 343, Seq. ID No. 345, Seq. ID No. 347, Seq. ID No. 349, Seq. ID No. 351, Seq. ID No. 353, Seq. ID No. 355, Seq. ID No. 361, Seq. ID No. 363, Seq. ID No. 365, Seq. ID No. 367, Seq. ID No. 369, Seq. ID No. 371, Seq. ID No. 377, Seq. ID No. 379, Seq. ID No. 381, Seq. ID No. 383, Seq. ID No. 385, Seq. ID No. 387, Seq. ID No. 389, Seq. ID No. 391, Seq. ID No. 395, Seq. ID No. 397, Seq. ID No. 399, Seq. ID No. 405, Seq. ID No. 407, Seq. ID No. 409, Seq. ID No. 411, Seq. ID No. 413, Seq. ID No. 415, Seq. ID No. 417, Seq. ID No. 419, Seq. ID No. 421, Seq. ID No. 423, Seq. ID No. 425, Seq. ID No. 427, Seq. ID No. 429, Seq. ID No. 431, Seq. ID No. 433, Seq. ID No. 435, Seq. ID No. 437, Seq. ID No. 439, Seq. ID No. 441, Seq. ID No. 443, Seq. ID No. 445, Seq. ID No. 447, Seq. ID No. 449, Seq. ID No. 451, Seq. ID No. 453, Seq. ID No. 459, Seq. ID No. 461, Seq. ID No. 463, Seq. ID No. 465, Seq. ID No. 467, Seq. ID No. 469, Seq. ID No. 471, Seq. ID No. 473,



Seq. ID No. 475, Seq. ID No. 479, Seq. ID No. 481, Seq. ID No. 483, Seq. ID No. 485,  
Seq. ID No. 501, Seq. ID No. 507, Seq. ID No. 517, Seq. ID No. 519, Seq. ID No. 521,  
Seq. ID No. 523, Seq. ID No. 529, Seq. ID No. 531, Seq. ID No. 533, Seq. ID No. 535,  
Seq. ID No. 537, Seq. ID No. 539, Seq. ID No. 541, Seq. ID No. 543, Seq. ID No. 551,  
5 Seq. ID No. 553, Seq. ID No. 555, Seq. ID No. 559, Seq. ID No. 561, Seq. ID No. 563,  
Seq. ID No. 565, Seq. ID No. 571, Seq. ID No. 573, Seq. ID No. 581, Seq. ID No. 583,  
Seq. ID No. 585, Seq. ID No. 587, Seq. ID No. 589, Seq. ID No. 595, Seq. ID No. 597,  
Seq. ID No. 601, Seq. ID No. 603, Seq. ID No. 605, Seq. ID No. 607, Seq. ID No. 609,  
Seq. ID No. 611, Seq. ID No. 613, Seq. ID No. 615, Seq. ID No. 619, Seq. ID No. 621,  
10 Seq. ID No. 623, Seq. ID No. 625, Seq. ID No. 627, Seq. ID No. 629, Seq. ID No. 631,  
Seq. ID No. 633, Seq. ID No. 635, Seq. ID No. 649, Seq. ID No. 651, Seq. ID No. 663,  
Seq. ID No. 665, Seq. ID No. 671, Seq. ID No. 673, Seq. ID No. 681, Seq. ID No. 683,  
Seq. ID No. 685, Seq. ID No. 687, Seq. ID No. 689, Seq. ID No. 691, Seq. ID No. 693,  
Seq. ID No. 695, Seq. ID No. 697, Seq. ID No. 699, Seq. ID No. 701, Seq. ID No. 703,  
15 Seq. ID No. 705, Seq. ID No. 707, Seq. ID No. 709, Seq. ID No. 711, Seq. ID No. 713,  
Seq. ID No. 727, Seq. ID No. 729, Seq. ID No. 731, Seq. ID No. 733, Seq. ID No. 735,  
Seq. ID No. 737, Seq. ID No. 739, Seq. ID No. 741, Seq. ID No. 743, Seq. ID No. 753,  
Seq. ID No. 767, Seq. ID No. 771, Seq. ID No. 773, Seq. ID No. 775, Seq. ID No. 783,  
Seq. ID No. 785, Seq. ID No. 787, Seq. ID No. 789, Seq. ID No. 791, Seq. ID No. 793,  
20 Seq. ID No. 795, Seq. ID No. 797, Seq. ID No. 799, Seq. ID No. 801, Seq. ID No. 803,  
Seq. ID No. 805, Seq. ID No. 811, Seq. ID No. 813, Seq. ID No. 815, Seq. ID No. 817,  
Seq. ID No. 821, Seq. ID No. 823, Seq. ID No. 827, Seq. ID No. 829, Seq. ID No. 831,  
Seq. ID No. 833, Seq. ID No. 835, Seq. ID No. 837, Seq. ID No. 839, Seq. ID No. 841,  
Seq. ID No. 843, Seq. ID No. 845, Seq. ID No. 847, Seq. ID No. 849, Seq. ID No. 851,  
25 Seq. ID No. 853, Seq. ID No. 855, Seq. ID No. 857, Seq. ID No. 859, Seq. ID No. 861,  
Seq. ID No. 865, Seq. ID No. 867, Seq. ID No. 869, Seq. ID No. 871, Seq. ID No. 873,  
Seq. ID No. 875, Seq. ID No. 877, Seq. ID No. 879, Seq. ID No. 881, Seq. ID No. 883,  
Seq. ID No. 885, Seq. ID No. 887, Seq. ID No. 889, Seq. ID No. 891, Seq. ID No. 895,  
Seq. ID No. 897, Seq. ID No. 899, Seq. ID No. 903, Seq. ID No. 905, Seq. ID No. 907,  
30 Seq. ID No. 909, Seq. ID No. 911, Seq. ID No. 913, Seq. ID No. 915, Seq. ID No. 917,  
Seq. ID No. 919, Seq. ID No. 921, Seq. ID No. 923, Seq. ID No. 925, Seq. ID No. 927,  
Seq. ID No. 929, Seq. ID No. 931, Seq. ID No. 933, Seq. ID No. 939, Seq. ID No. 945,  
Seq. ID No. 947, Seq. ID No. 949, Seq. ID No. 951, Seq. ID No. 953, Seq. ID No. 959,

Seq. ID No. 961, Seq. ID No. 963, Seq. ID No. 965, Seq. ID No. 969, Seq. ID No. 971,  
Seq. ID No. 973, Seq. ID No. 975, Seq. ID No. 977, Seq. ID No. 987, Seq. ID No. 989,  
Seq. ID No. 991, Seq. ID No. 993, Seq. ID No. 995, Seq. ID No. 997, Seq. ID No. 999,  
Seq. ID No. 1017, Seq. ID No. 1021, Seq. ID No. 1023, Seq. ID No. 1025, Seq. ID No.  
5 1027, Seq. ID No. 1041, Seq. ID No. 1043, Seq. ID No. 1047, Seq. ID No. 1049, Seq. ID  
No. 1051, Seq. ID No. 1053, Seq. ID No. 1057, Seq. ID No. 1059, Seq. ID No. 1061,  
Seq. ID No. 1063, Seq. ID No. 1065, Seq. ID No. 1067, Seq. ID No. 1069, Seq. ID No.  
1071, Seq. ID No. 1073, Seq. ID No. 1079, Seq. ID No. 1081, Seq. ID No. 1083, Seq. ID  
No. 1085, Seq. ID No. 1087, Seq. ID No. 1089, Seq. ID No. 1091, Seq. ID No. 1093,  
10 Seq. ID No. 1095, Seq. ID No. 1097, Seq. ID No. 1099, Seq. ID No. 1101, Seq. ID No.  
1103, Seq. ID No. 1109, Seq. ID No. 1111, Seq. ID No. 1113, Seq. ID No. 1115, Seq. ID  
No. 1117, Seq. ID No. 1119, Seq. ID No. 1121, Seq. ID No. 1123, Seq. ID No. 1125,  
Seq. ID No. 1127, Seq. ID No. 1129, Seq. ID No. 1133, Seq. ID No. 1141, Seq. ID No.  
1143, Seq. ID No. 1145, Seq. ID No. 1147, Seq. ID No. 1149, Seq. ID No. 1153, Seq. ID  
15 No. 1155, Seq. ID No. 1157, Seq. ID No. 1159, Seq. ID No. 1161, Seq. ID No. 1163,  
Seq. ID No. 1171, Seq. ID No. 1175, Seq. ID No. 1177, Seq. ID No. 1179, Seq. ID No.  
1181, Seq. ID No. 1185, Seq. ID No. 1187, Seq. ID No. 1189, Seq. ID No. 1191, Seq. ID  
No. 1193, Seq. ID No. 1199, Seq. ID No. 1201, Seq. ID No. 1205, Seq. ID No. 1207,  
Seq. ID No. 1209, Seq. ID No. 1211, Seq. ID No. 1215, Seq. ID No. 1217, Seq. ID No.  
20 1219, Seq. ID No. 1221, Seq. ID No. 1225, Seq. ID No. 1231, Seq. ID No. 1233, Seq. ID  
No. 1235, Seq. ID No. 1239, Seq. ID No. 1241, Seq. ID No. 1247, Seq. ID No. 1249,  
Seq. ID No. 1251, Seq. ID No. 1253, Seq. ID No. 1255, Seq. ID No. 1257, Seq. ID No.  
1261, Seq. ID No. 1263, Seq. ID No. 1273, Seq. ID No. 1275, Seq. ID No. 1277, Seq. ID  
No. 1279, Seq. ID No. 1281, Seq. ID No. 1285, Seq. ID No. 1293, Seq. ID No. 1299,  
25 Seq. ID No. 1301, Seq. ID No. 1307, Seq. ID No. 1309, Seq. ID No. 1311, Seq. ID No.  
1313, Seq. ID No. 1321, Seq. ID No. 1323, Seq. ID No. 1333, Seq. ID No. 1335, Seq. ID  
No. 1339, Seq. ID No. 1345, Seq. ID No. 1355, Seq. ID No. 1357, Seq. ID No. 1359,  
Seq. ID No. 1361, Seq. ID No. 1363, Seq. ID No. 1373, Seq. ID No. 1375, Seq. ID No.  
1377, Seq. ID No. 1379, Seq. ID No. 1383, Seq. ID No. 1385, Seq. ID No. 1387, Seq. ID  
30 No. 1389, Seq. ID No. 1391, Seq. ID No. 1393, Seq. ID No. 1395, Seq. ID No. 1397,  
Seq. ID No. 1399, Seq. ID No. 1403, Seq. ID No. 1405, Seq. ID No. 1407, Seq. ID No.  
1409, Seq. ID No. 1411, Seq. ID No. 1413, Seq. ID No. 1415, Seq. ID No. 1417, Seq. ID  
No. 1419, Seq. ID No. 1421, Seq. ID No. 1423, Seq. ID No. 1425, Seq. ID No. 1427,

Seq. ID No. 1431, Seq. ID No. 1433, Seq. ID No. 1437, Seq. ID No. 1439, Seq. ID No. 1441, Seq. ID No. 1443, Seq. ID No. 1449, Seq. ID No. 1451, Seq. ID No. 1453, Seq. ID No. 1455, Seq. ID No. 1457, Seq. ID No. 1459, Seq. ID No. 1461, Seq. ID No. 1463, Seq. ID No. 1465, Seq. ID No. 1467, Seq. ID No. 1469, Seq. ID No. 1471, Seq. ID No. 1473, Seq. ID No. 1475, Seq. ID No. 1477, Seq. ID No. 1479, Seq. ID No. 1483, Seq. ID No. 1485, Seq. ID No. 1487, Seq. ID No. 1489, Seq. ID No. 1491, Seq. ID No. 1493, Seq. ID No. 1495, Seq. ID No. 1497, Seq. ID No. 1499, Seq. ID No. 1501, Seq. ID No. 1503, Seq. ID No. 1505, Seq. ID No. 1507, Seq. ID No. 1509, Seq. ID No. 1511, Seq. ID No. 1519, Seq. ID No. 1521, Seq. ID No. 1523, Seq. ID No. 1525, Seq. ID No. 1527, Seq. ID No. 1531, Seq. ID No. 1537, Seq. ID No. 1539, Seq. ID No. 1541, Seq. ID No. 1543, Seq. ID No. 1549, Seq. ID No. 1555, Seq. ID No. 1557, Seq. ID No. 1565, Seq. ID No. 1567, Seq. ID No. 1569, Seq. ID No. 1573, Seq. ID No. 1575, Seq. ID No. 1577, Seq. ID No. 1581, Seq. ID No. 1587, Seq. ID No. 1589, Seq. ID No. 1591, Seq. ID No. 1593, Seq. ID No. 1595, Seq. ID No. 1597, Seq. ID No. 1601, Seq. ID No. 1603, Seq. ID No. 1605, Seq. ID No. 1607, Seq. ID No. 1609, Seq. ID No. 1611, Seq. ID No. 1613, Seq. ID No. 1615, Seq. ID No. 1617, Seq. ID No. 1619, Seq. ID No. 1623, Seq. ID No. 1625, Seq. ID No. 1627, Seq. ID No. 1629, Seq. ID No. 1631, Seq. ID No. 1635, Seq. ID No. 1637, Seq. ID No. 1641, Seq. ID No. 1651, Seq. ID No. 1655, Seq. ID No. 1657, Seq. ID No. 1659, Seq. ID No. 1667, Seq. ID No. 1669, Seq. ID No. 1675, Seq. ID No. 1683, Seq. ID No. 1685, Seq. ID No. 1687, Seq. ID No. 1689, Seq. ID No. 1691, Seq. ID No. 1695, Seq. ID No. 1697, Seq. ID No. 1699, Seq. ID No. 1701, Seq. ID No. 1703, Seq. ID No. 1705, Seq. ID No. 1709, Seq. ID No. 1713, Seq. ID No. 1715, Seq. ID No. 1717, Seq. ID No. 1719, Seq. ID No. 1721, Seq. ID No. 1723, Seq. ID No. 1725, Seq. ID No. 1727, Seq. ID No. 1729, Seq. ID No. 1735, Seq. ID No. 1739, Seq. ID No. 1741, Seq. ID No. 1743, Seq. ID No. 1745, Seq. ID No. 1747, Seq. ID No. 1749, Seq. ID No. 1751, Seq. ID No. 1759, Seq. ID No. 1761, Seq. ID No. 1763, Seq. ID No. 1769, Seq. ID No. 1773, Seq. ID No. 1775, Seq. ID No. 1777, Seq. ID No. 1779, Seq. ID No. 1783, Seq. ID No. 1785, Seq. ID No. 1789, Seq. ID No. 1793, Seq. ID No. 1795, Seq. ID No. 1799, Seq. ID No. 1801, Seq. ID No. 1803, Seq. ID No. 1807, Seq. ID No. 1809, Seq. ID No. 1811, Seq. ID No. 1813, Seq. ID No. 1815, Seq. ID No. 1817, Seq. ID No. 1825, Seq. ID No. 1827, Seq. ID No. 1829, Seq. ID No. 1831, Seq. ID No. 1833, Seq. ID No. 1835, Seq. ID No. 1837, Seq. ID No. 1841, Seq. ID No. 1843, Seq. ID No. 1845, Seq. ID No. 1847, Seq. ID No. 1849, Seq. ID No. 1851, Seq. ID No. 1853, Seq. ID No. 1855,

Seq. ID No. 1859, Seq. ID No. 1861, Seq. ID No. 1863, Seq. ID No. 1865, Seq. ID No. 1867, Seq. ID No. 1871, Seq. ID No. 1873, Seq. ID No. 1877, Seq. ID No. 1879, Seq. ID No. 1881, Seq. ID No. 1883, Seq. ID No. 1885, Seq. ID No. 1887, Seq. ID No. 1889, Seq. ID No. 1897, Seq. ID No. 1899, Seq. ID No. 1901, Seq. ID No. 1903, Seq. ID No. 1905, Seq. ID No. 1907, Seq. ID No. 1909, Seq. ID No. 1911, Seq. ID No. 1913, Seq. ID No. 1921, Seq. ID No. 1925, Seq. ID No. 1931, Seq. ID No. 1933, Seq. ID No. 1935, Seq. ID No. 1937, Seq. ID No. 1939, Seq. ID No. 1941, Seq. ID No. 1943, Seq. ID No. 1945, Seq. ID No. 1947, Seq. ID No. 1949, Seq. ID No. 1951, Seq. ID No. 1953, Seq. ID No. 1955, Seq. ID No. 1957, Seq. ID No. 1959, Seq. ID No. 1961, Seq. ID No. 1963, Seq. ID No. 1965, Seq. ID No. 1967, Seq. ID No. 1971, Seq. ID No. 1973, Seq. ID No. 1975, Seq. ID No. 1977, Seq. ID No. 1979, Seq. ID No. 1983, Seq. ID No. 1985, Seq. ID No. 1987, Seq. ID No. 1989, Seq. ID No. 1995, Seq. ID No. 1997, Seq. ID No. 1999, Seq. ID No. 2001, Seq. ID No. 2003, Seq. ID No. 2007, Seq. ID No. 2009, Seq. ID No. 2011, Seq. ID No. 2015, Seq. ID No. 2021, Seq. ID No. 2023, Seq. ID No. 2029, Seq. ID No. 2031, Seq. ID No. 2037, Seq. ID No. 2039, Seq. ID No. 2043, Seq. ID No. 2045, Seq. ID No. 2047, Seq. ID No. 2051, Seq. ID No. 2057, Seq. ID No. 2059, Seq. ID No. 2061, Seq. ID No. 2063, Seq. ID No. 2065, Seq. ID No. 2067, Seq. ID No. 2069, Seq. ID No. 2071, Seq. ID No. 2073, Seq. ID No. 2075, Seq. ID No. 2077, Seq. ID No. 2079, Seq. ID No. 2081, Seq. ID No. 2083, Seq. ID No. 2085, Seq. ID No. 2093, Seq. ID No. 2095, Seq. ID No. 2097, Seq. ID No. 2099, Seq. ID No. 2101, Seq. ID No. 2103, Seq. ID No. 2111, Seq. ID No. 2117, Seq. ID No. 2119, Seq. ID No. 2129, Seq. ID No. 2131, Seq. ID No. 2133, Seq. ID No. 2135, Seq. ID No. 2137, Seq. ID No. 2139, Seq. ID No. 2141, Seq. ID No. 2143, Seq. ID No. 2145, Seq. ID No. 2147, Seq. ID No. 2153, Seq. ID No. 2161, Seq. ID No. 2163, Seq. ID No. 2165, Seq. ID No. 2167, Seq. ID No. 2169, Seq. ID No. 2175, Seq. ID No. 2179, Seq. ID No. 2181, Seq. ID No. 2183, Seq. ID No. 2185, Seq. ID No. 2189, Seq. ID No. 2193, Seq. ID No. 2195, Seq. ID No. 2197, Seq. ID No. 2199, Seq. ID No. 2201, Seq. ID No. 2203, Seq. ID No. 2207, Seq. ID No. 2209, Seq. ID No. 2211, Seq. ID No. 2213, Seq. ID No. 2215, Seq. ID No. 2217, Seq. ID No. 2219, Seq. ID No. 2221, Seq. ID No. 2223, Seq. ID No. 2225, Seq. ID No. 2227, Seq. ID No. 2229, Seq. ID No. 2231, Seq. ID No. 2233, Seq. ID No. 2235, Seq. ID No. 2241, Seq. ID No. 2243, Seq. ID No. 2247, Seq. ID No. 2253, Seq. ID No. 2257, Seq. ID No. 2261, Seq. ID No. 2263, Seq. ID No. 2265, Seq. ID No. 2267, Seq. ID No. 2269, Seq. ID No. 2273, Seq. ID No. 2275, Seq. ID No. 2277, Seq. ID No. 2279, Seq. ID No. 2281,

Seq. ID No. 2285, Seq. ID No. 2287, Seq. ID No. 2297, Seq. ID No. 2299, Seq. ID No. 2301, Seq. ID No. 2309, Seq. ID No. 2311, Seq. ID No. 2313, Seq. ID No. 2315, Seq. ID No. 2331, Seq. ID No. 2335, Seq. ID No. 2337, Seq. ID No. 2339, Seq. ID No. 2341, Seq. ID No. 2345, Seq. ID No. 2359, Seq. ID No. 2361, Seq. ID No. 2363, Seq. ID No. 2369, Seq. ID No. 2373, Seq. ID No. 2377, Seq. ID No. 2379, Seq. ID No. 2381, Seq. ID No. 2383, Seq. ID No. 2385, Seq. ID No. 2395, Seq. ID No. 2397, Seq. ID No. 2399, Seq. ID No. 2401, Seq. ID No. 2403, Seq. ID No. 2405, Seq. ID No. 2409, Seq. ID No. 2411, Seq. ID No. 2413, Seq. ID No. 2415, Seq. ID No. 2417, Seq. ID No. 2423, Seq. ID No. 2431, Seq. ID No. 2435, Seq. ID No. 2437, Seq. ID No. 2439, Seq. ID No. 2441, Seq. ID No. 2443, Seq. ID No. 2445, Seq. ID No. 2447, Seq. ID No. 2451, Seq. ID No. 2453, Seq. ID No. 2455, Seq. ID No. 2457, Seq. ID No. 2461, Seq. ID No. 2463, Seq. ID No. 2465, Seq. ID No. 2467, Seq. ID No. 2469, Seq. ID No. 2471, Seq. ID No. 2473, Seq. ID No. 2475, Seq. ID No. 2477, Seq. ID No. 2479, Seq. ID No. 2481, Seq. ID No. 2483, Seq. ID No. 2485, Seq. ID No. 2495, Seq. ID No. 2505, Seq. ID No. 2509, Seq. ID No. 2511, Seq. ID No. 2513, Seq. ID No. 2519, Seq. ID No. 2521, Seq. ID No. 2529, Seq. ID No. 2539, Seq. ID No. 2547, Seq. ID No. 2549, Seq. ID No. 2551, Seq. ID No. 2553, Seq. ID No. 2559, Seq. ID No. 2561, Seq. ID No. 2563, Seq. ID No. 2567, Seq. ID No. 2573, Seq. ID No. 2575, Seq. ID No. 2577, Seq. ID No. 2579, Seq. ID No. 2581, Seq. ID No. 2585, Seq. ID No. 2587, Seq. ID No. 2589, Seq. ID No. 2593, Seq. ID No. 2595, Seq. ID No. 2603, Seq. ID No. 2605, Seq. ID No. 2609, Seq. ID No. 2613, Seq. ID No. 2615, Seq. ID No. 2617, Seq. ID No. 2619, Seq. ID No. 2623, Seq. ID No. 2625, Seq. ID No. 2631, Seq. ID No. 2633, Seq. ID No. 2635, Seq. ID No. 2637, Seq. ID No. 2639, Seq. ID No. 2641, Seq. ID No. 2643, Seq. ID No. 2645, Seq. ID No. 2647, Seq. ID No. 2649, Seq. ID No. 2653, Seq. ID No. 2655, Seq. ID No. 2657, Seq. ID No. 2659, Seq. ID No. 2661, Seq. ID No. 2663, Seq. ID No. 2665, Seq. ID No. 2667, Seq. ID No. 2669, Seq. ID No. 2671, Seq. ID No. 2673, Seq. ID No. 2675, Seq. ID No. 2677, Seq. ID No. 2685, Seq. ID No. 2687, Seq. ID No. 2689, Seq. ID No. 2709, Seq. ID No. 2711, Seq. ID No. 2713, Seq. ID No. 2715, Seq. ID No. 2719, Seq. ID No. 2721, Seq. ID No. 2723, Seq. ID No. 2725, Seq. ID No. 2727, Seq. ID No. 2735, Seq. ID No. 2737, Seq. ID No. 2739, Seq. ID No. 2741, Seq. ID No. 2743, Seq. ID No. 2745, Seq. ID No. 2747, Seq. ID No. 2749, Seq. ID No. 2751, Seq. ID No. 2753, Seq. ID No. 2755, Seq. ID No. 2757, Seq. ID No. 2759, Seq. ID No. 2761, Seq. ID No. 2763, Seq. ID No. 2765, Seq. ID No. 2767, Seq. ID No. 2769, Seq. ID No. 2771, Seq. ID No. 2773, Seq. ID No. 2775,

Seq. ID No. 2777, Seq. ID No. 2779, Seq. ID No. 2781, Seq. ID No. 2787, Seq. ID No. 2789, Seq. ID No. 2791, Seq. ID No. 2793, Seq. ID No. 2795, Seq. ID No. 2797, Seq. ID No. 2799, Seq. ID No. 2803, Seq. ID No. 2805, Seq. ID No. 2807, Seq. ID No. 2811, Seq. ID No. 2817, Seq. ID No. 2825, Seq. ID No. 2827, Seq. ID No. 2829, Seq. ID No. 2843, Seq. ID No. 2847, Seq. ID No. 2849, Seq. ID No. 2851, Seq. ID No. 2857, Seq. ID No. 2863, Seq. ID No. 2865, Seq. ID No. 2867, Seq. ID No. 2869, Seq. ID No. 2871, Seq. ID No. 2875, Seq. ID No. 2877, Seq. ID No. 2879, Seq. ID No. 2883, Seq. ID No. 2885, Seq. ID No. 2887, Seq. ID No. 2889, Seq. ID No. 2891, Seq. ID No. 2895, Seq. ID No. 2897, Seq. ID No. 2899, Seq. ID No. 2901, Seq. ID No. 2903, Seq. ID No. 2907, Seq. ID No. 2909, Seq. ID No. 2911, Seq. ID No. 2913, Seq. ID No. 2915, Seq. ID No. 2917, Seq. ID No. 2919, Seq. ID No. 2921, Seq. ID No. 2923, Seq. ID No. 2925, Seq. ID No. 2927, Seq. ID No. 2929, Seq. ID No. 2931, Seq. ID No. 2933, Seq. ID No. 2943, Seq. ID No. 2945, Seq. ID No. 2953, Seq. ID No. 2955, Seq. ID No. 2957, Seq. ID No. 2959, Seq. ID No. 2961, Seq. ID No. 2963, Seq. ID No. 2965, Seq. ID No. 2967, Seq. ID No. 2971, Seq. ID No. 2979, Seq. ID No. 2985, Seq. ID No. 2989, Seq. ID No. 2993, Seq. ID No. 2999, Seq. ID No. 3001, Seq. ID No. 3003, Seq. ID No. 3015, Seq. ID No. 3017, Seq. ID No. 3019, Seq. ID No. 3021, Seq. ID No. 3033, Seq. ID No. 3035, Seq. ID No. 3037, Seq. ID No. 3039, Seq. ID No. 3041, Seq. ID No. 3045, Seq. ID No. 3047, Seq. ID No. 3049, Seq. ID No. 3051, Seq. ID No. 3053, Seq. ID No. 3057, Seq. ID No. 3059, Seq. ID No. 3061, Seq. ID No. 3065, Seq. ID No. 3067, Seq. ID No. 3069, Seq. ID No. 3079, Seq. ID No. 3081, Seq. ID No. 3083, Seq. ID No. 3085, Seq. ID No. 3087, Seq. ID No. 3089, Seq. ID No. 3091, Seq. ID No. 3093, Seq. ID No. 3095, Seq. ID No. 3097, Seq. ID No. 3099, Seq. ID No. 3101, Seq. ID No. 3103, Seq. ID No. 3105, Seq. ID No. 3107, Seq. ID No. 3109, Seq. ID No. 3111, Seq. ID No. 3113, Seq. ID No. 3115, Seq. ID No. 3117, Seq. ID No. 3125, Seq. ID No. 3127, Seq. ID No. 3129, Seq. ID No. 3131, Seq. ID No. 3133, Seq. ID No. 3135, Seq. ID No. 3137, Seq. ID No. 3139, Seq. ID No. 3141, Seq. ID No. 3143, Seq. ID No. 3147, Seq. ID No. 3149, Seq. ID No. 3151, Seq. ID No. 3153, Seq. ID No. 3159, Seq. ID No. 3161, Seq. ID No. 3167, Seq. ID No. 3169, Seq. ID No. 3171, Seq. ID No. 3175, Seq. ID No. 3177, Seq. ID No. 3179, Seq. ID No. 3181, Seq. ID No. 3185, Seq. ID No. 3187, Seq. ID No. 3189, Seq. ID No. 3191, Seq. ID No. 3195, Seq. ID No. 3197, Seq. ID No. 3199, Seq. ID No. 3203, Seq. ID No. 3205, Seq. ID No. 3207, Seq. ID No. 3209, Seq. ID No. 3211, Seq. ID No. 3221, Seq. ID No. 3223, Seq. ID No. 3225, Seq. ID No. 3227, Seq. ID No. 3229, Seq. ID No. 3231,

Seq. ID No. 3233, Seq. ID No. 3235, Seq. ID No. 3237, Seq. ID No. 3239, Seq. ID No. 3247, Seq. ID No. 3251, Seq. ID No. 3253, Seq. ID No. 3259, Seq. ID No. 3265, Seq. ID No. 3267, Seq. ID No. 3271, Seq. ID No. 3273, Seq. ID No. 3279, Seq. ID No. 3281, Seq. ID No. 3283, Seq. ID No. 3285, Seq. ID No. 3287, Seq. ID No. 3289, Seq. ID No. 3291, Seq. ID No. 3293, Seq. ID No. 3295, Seq. ID No. 3299, Seq. ID No. 3301, Seq. ID No. 3303, Seq. ID No. 3305, Seq. ID No. 3307, Seq. ID No. 3309, Seq. ID No. 3311, Seq. ID No. 3313, Seq. ID No. 3315, Seq. ID No. 3319, Seq. ID No. 3321, Seq. ID No. 3327, Seq. ID No. 3329, Seq. ID No. 3333, Seq. ID No. 3341, Seq. ID No. 3343, Seq. ID No. 3345, Seq. ID No. 3347, Seq. ID No. 3361, Seq. ID No. 3363, Seq. ID No. 3365, Seq. ID No. 3367, Seq. ID No. 3369, Seq. ID No. 3371, Seq. ID No. 3373, Seq. ID No. 3379, Seq. ID No. 3381, Seq. ID No. 3383, Seq. ID No. 3385, Seq. ID No. 3387, Seq. ID No. 3393, Seq. ID No. 3397, Seq. ID No. 3399, Seq. ID No. 3401, Seq. ID No. 3403, Seq. ID No. 3407, Seq. ID No. 3409, Seq. ID No. 3411, Seq. ID No. 3413, Seq. ID No. 3417, Seq. ID No. 3419, Seq. ID No. 3423, Seq. ID No. 3429, Seq. ID No. 3431, Seq. ID No. 3435, Seq. ID No. 3437, Seq. ID No. 3439, Seq. ID No. 3443, Seq. ID No. 3445, Seq. ID No. 3447, Seq. ID No. 3459, Seq. ID No. 3461, Seq. ID No. 3465, Seq. ID No. 3467, Seq. ID No. 3469, Seq. ID No. 3471, Seq. ID No. 3473, Seq. ID No. 3475, Seq. ID No. 3477, Seq. ID No. 3479, Seq. ID No. 3483, Seq. ID No. 3485, Seq. ID No. 3487, Seq. ID No. 3489, Seq. ID No. 3495, Seq. ID No. 3497, Seq. ID No. 3499, Seq. ID No. 3501, Seq. ID No. 3507, Seq. ID No. 3509, Seq. ID No. 3511, Seq. ID No. 3513, Seq. ID No. 3515, Seq. ID No. 3521, Seq. ID No. 3523, Seq. ID No. 3525, Seq. ID No. 3529, Seq. ID No. 3533, Seq. ID No. 3535, Seq. ID No. 3537, Seq. ID No. 3541, Seq. ID No. 3543, Seq. ID No. 3545, Seq. ID No. 3547, Seq. ID No. 3549, Seq. ID No. 3551, Seq. ID No. 3553, Seq. ID No. 3555, Seq. ID No. 3557, Seq. ID No. 3559, Seq. ID No. 3563, Seq. ID No. 3565, Seq. ID No. 3567, Seq. ID No. 3569, Seq. ID No. 3571, Seq. ID No. 3575, Seq. ID No. 3577, Seq. ID No. 3579, Seq. ID No. 3583, Seq. ID No. 3585, Seq. ID No. 3589, Seq. ID No. 3591, Seq. ID No. 3597, Seq. ID No. 3599, Seq. ID No. 3601, Seq. ID No. 3603, Seq. ID No. 3605, Seq. ID No. 3607, Seq. ID No. 3609, Seq. ID No. 3613, Seq. ID No. 3615, Seq. ID No. 3623, Seq. ID No. 3627, Seq. ID No. 3631, Seq. ID No. 3633, Seq. ID No. 3637, Seq. ID No. 3639, Seq. ID No. 3641, Seq. ID No. 3643, Seq. ID No. 3645, Seq. ID No. 3647, Seq. ID No. 3649, Seq. ID No. 3651, Seq. ID No. 3653, Seq. ID No. 3655, Seq. ID No. 3657, Seq. ID No. 3659, Seq. ID No. 3661, Seq. ID No. 3663, Seq. ID No. 3665, Seq. ID No. 3667, Seq. ID No. 3669, Seq. ID No. 3671,

Seq. ID No. 3673, Seq. ID No. 3675, Seq. ID No. 3681, Seq. ID No. 3683, Seq. ID No. 3685, Seq. ID No. 3687, Seq. ID No. 3691, Seq. ID No. 3693, Seq. ID No. 3695, Seq. ID No. 3697, Seq. ID No. 3699, Seq. ID No. 3701, Seq. ID No. 3703, Seq. ID No. 3705, Seq. ID No. 3707, Seq. ID No. 3709, Seq. ID No. 3711, Seq. ID No. 3713, Seq. ID No. 3715, Seq. ID No. 3719, Seq. ID No. 3721, Seq. ID No. 3725, Seq. ID No. 3729, Seq. ID No. 3731, Seq. ID No. 3733, Seq. ID No. 3735, Seq. ID No. 3737, Seq. ID No. 3739, Seq. ID No. 3743, Seq. ID No. 3747, Seq. ID No. 3749, Seq. ID No. 3751, Seq. ID No. 3759, Seq. ID No. 3767, Seq. ID No. 3769, Seq. ID No. 3771, Seq. ID No. 3773, Seq. ID No. 3775, Seq. ID No. 3777, Seq. ID No. 3779, Seq. ID No. 3785, Seq. ID No. 3787, Seq. ID No. 3789, Seq. ID No. 3791, Seq. ID No. 3795, Seq. ID No. 3797, Seq. ID No. 3801, Seq. ID No. 3803, Seq. ID No. 3805, Seq. ID No. 3809, Seq. ID No. 3811, Seq. ID No. 3819, Seq. ID No. 3821, Seq. ID No. 3823, Seq. ID No. 3825, Seq. ID No. 3827, Seq. ID No. 3829, Seq. ID No. 3831, Seq. ID No. 3833, Seq. ID No. 3835, Seq. ID No. 3841, Seq. ID No. 3843, Seq. ID No. 3845, Seq. ID No. 3847, Seq. ID No. 3855, Seq. ID No. 3857, Seq. ID No. 3867, Seq. ID No. 3869, Seq. ID No. 3871, Seq. ID No. 3873, Seq. ID No. 3875, Seq. ID No. 3877, Seq. ID No. 3881, Seq. ID No. 3883, Seq. ID No. 3885, Seq. ID No. 3887, Seq. ID No. 3893, Seq. ID No. 3897, Seq. ID No. 3899, Seq. ID No. 3901, Seq. ID No. 3905, Seq. ID No. 3907, Seq. ID No. 3909, Seq. ID No. 3911, Seq. ID No. 3913, Seq. ID No. 3917, Seq. ID No. 3919, Seq. ID No. 3921, Seq. ID No. 3927, Seq. ID No. 3929, Seq. ID No. 3931, Seq. ID No. 3933, Seq. ID No. 3935, Seq. ID No. 3937, Seq. ID No. 3939, Seq. ID No. 3941, Seq. ID No. 3943, Seq. ID No. 3945, Seq. ID No. 3947, Seq. ID No. 3949, Seq. ID No. 3951, Seq. ID No. 3953, Seq. ID No. 3955, Seq. ID No. 3957, Seq. ID No. 3961, Seq. ID No. 3965, Seq. ID No. 3967, Seq. ID No. 3969, Seq. ID No. 3971, Seq. ID No. 3977, Seq. ID No. 3979, Seq. ID No. 3981, Seq. ID No. 3983, Seq. ID No. 3985, Seq. ID No. 3987, Seq. ID No. 3989, Seq. ID No. 3991, Seq. ID No. 3999, Seq. ID No. 4001, Seq. ID No. 4003, Seq. ID No. 4011, Seq. ID No. 4013, Seq. ID No. 4015, Seq. ID No. 4017, Seq. ID No. 4019, Seq. ID No. 4021, Seq. ID No. 4023, Seq. ID No. 4029, Seq. ID No. 4031, Seq. ID No. 4033, Seq. ID No. 4035, Seq. ID No. 4037, Seq. ID No. 4051, Seq. ID No. 4053, Seq. ID No. 4055, Seq. ID No. 4057, Seq. ID No. 4059, Seq. ID No. 4063, Seq. ID No. 4065, Seq. ID No. 4067, Seq. ID No. 4069, Seq. ID No. 4075, Seq. ID No. 4077, Seq. ID No. 4085, Seq. ID No. 4087, Seq. ID No. 4089, Seq. ID No. 4091, Seq. ID No. 4093, Seq. ID No. 4095, Seq. ID No. 4097, Seq. ID No. 4099, Seq. ID No. 4105, Seq. ID No. 4107, Seq. ID No. 4109,



Seq. ID No. 4113, Seq. ID No. 4115, Seq. ID No. 4117, Seq. ID No. 4119, Seq. ID No. 4121, Seq. ID No. 4123, Seq. ID No. 4125, Seq. ID No. 4127, Seq. ID No. 4129, Seq. ID No. 4131, Seq. ID No. 4147, Seq. ID No. 4149, Seq. ID No. 4155, Seq. ID No. 4157, Seq. ID No. 4159, Seq. ID No. 4161, Seq. ID No. 4163, Seq. ID No. 4165, Seq. ID No. 4167, Seq. ID No. 4169, Seq. ID No. 4171, Seq. ID No. 4173, Seq. ID No. 4175, Seq. ID No. 4177, Seq. ID No. 4179, Seq. ID No. 4183, Seq. ID No. 4185, Seq. ID No. 4187, Seq. ID No. 4189, Seq. ID No. 4191, Seq. ID No. 4193, Seq. ID No. 4195, Seq. ID No. 4197, Seq. ID No. 4199, Seq. ID No. 4201, Seq. ID No. 4203, Seq. ID No. 4205, Seq. ID No. 4207, Seq. ID No. 4209, Seq. ID No. 4211, Seq. ID No. 4213, Seq. ID No. 4215, Seq. ID No. 4217, Seq. ID No. 4219, Seq. ID No. 4229, Seq. ID No. 4235, Seq. ID No. 4237, Seq. ID No. 4239, Seq. ID No. 4243, Seq. ID No. 4245, Seq. ID No. 4249, Seq. ID No. 4251, Seq. ID No. 4255, Seq. ID No. 4267, Seq. ID No. 4271, Seq. ID No. 4273, Seq. ID No. 4277, Seq. ID No. 4279, Seq. ID No. 4281, Seq. ID No. 4283, Seq. ID No. 4289, Seq. ID No. 4291, Seq. ID No. 4293, Seq. ID No. 4295, Seq. ID No. 4299, Seq. ID No. 4301, Seq. ID No. 4303, Seq. ID No. 4305, Seq. ID No. 4309, Seq. ID No. 4315, Seq. ID No. 4317, Seq. ID No. 4319, Seq. ID No. 4321, Seq. ID No. 4323, Seq. ID No. 4325, Seq. ID No. 4327, Seq. ID No. 4329, Seq. ID No. 4331, Seq. ID No. 4333, Seq. ID No. 4335, Seq. ID No. 4337, Seq. ID No. 4339, Seq. ID No. 4341, Seq. ID No. 4345, Seq. ID No. 4347, Seq. ID No. 4349, Seq. ID No. 4351, Seq. ID No. 4353, Seq. ID No. 4355, Seq. ID No. 4357, Seq. ID No. 4359, Seq. ID No. 4361, Seq. ID No. 4363, Seq. ID No. 4365, Seq. ID No. 4367, Seq. ID No. 4369, Seq. ID No. 4371, Seq. ID No. 4373, Seq. ID No. 4375, Seq. ID No. 4377, Seq. ID No. 4381, Seq. ID No. 4383, Seq. ID No. 4387, Seq. ID No. 4393, Seq. ID No. 4395, Seq. ID No. 4397, Seq. ID No. 4401, Seq. ID No. 4405, Seq. ID No. 4407, Seq. ID No. 4409, Seq. ID No. 4411, Seq. ID No. 4413, Seq. ID No. 4415, Seq. ID No. 4417, Seq. ID No. 4419, Seq. ID No. 4421, Seq. ID No. 4423, Seq. ID No. 4425, Seq. ID No. 4427, Seq. ID No. 4429, Seq. ID No. 4431, Seq. ID No. 4433, Seq. ID No. 4435, Seq. ID No. 4443, Seq. ID No. 4445, Seq. ID No. 4447, Seq. ID No. 4449, Seq. ID No. 4451, Seq. ID No. 4453, Seq. ID No. 4455, Seq. ID No. 4457, Seq. ID No. 4459, Seq. ID No. 4461, Seq. ID No. 4463, Seq. ID No. 4465, Seq. ID No. 4467, Seq. ID No. 4471, Seq. ID No. 4475, Seq. ID No. 4477, Seq. ID No. 4479, Seq. ID No. 4487, Seq. ID No. 4489, Seq. ID No. 4491, Seq. ID No. 4499, Seq. ID No. 4501, Seq. ID No. 4503, Seq. ID No. 4505, Seq. ID No. 4507, Seq. ID No. 4509, Seq. ID No. 4511, Seq. ID No. 4517, Seq. ID No. 4519, Seq. ID No. 4521, Seq. ID No. 4523,

Seq. ID No. 4525, Seq. ID No. 4531, Seq. ID No. 4535, Seq. ID No. 4537, Seq. ID No. 4539, Seq. ID No. 4541, Seq. ID No. 4543, Seq. ID No. 4545, Seq. ID No. 4547, Seq. ID No. 4549, Seq. ID No. 4551, Seq. ID No. 4553, Seq. ID No. 4555, Seq. ID No. 4557, Seq. ID No. 4559, Seq. ID No. 4561, Seq. ID No. 4563, Seq. ID No. 4565, Seq. ID No. 4567, Seq. ID No. 4569, Seq. ID No. 4571, Seq. ID No. 4573, Seq. ID No. 4575, Seq. ID No. 4577, Seq. ID No. 4579, Seq. ID No. 4581, Seq. ID No. 4583, Seq. ID No. 4585, Seq. ID No. 4591, Seq. ID No. 4593, Seq. ID No. 4595, Seq. ID No. 4597, Seq. ID No. 4599, Seq. ID No. 4601, Seq. ID No. 4603, Seq. ID No. 4605, Seq. ID No. 4607, Seq. ID No. 4609, Seq. ID No. 4611, Seq. ID No. 4613, Seq. ID No. 4615, Seq. ID No. 4617, Seq. ID No. 4619, Seq. ID No. 4621, Seq. ID No. 4623, Seq. ID No. 4625, Seq. ID No. 4627, Seq. ID No. 4629, Seq. ID No. 4631, Seq. ID No. 4633, Seq. ID No. 4635, Seq. ID No. 4637, Seq. ID No. 4645, Seq. ID No. 4647, Seq. ID No. 4649, Seq. ID No. 4651, Seq. ID No. 4653, Seq. ID No. 4655, Seq. ID No. 4657, Seq. ID No. 4661, Seq. ID No. 4663, Seq. ID No. 4665, Seq. ID No. 4667, Seq. ID No. 4669, Seq. ID No. 4671, Seq. ID No. 4673, Seq. ID No. 4675, Seq. ID No. 4677, Seq. ID No. 4679, Seq. ID No. 4683, Seq. ID No. 4685, Seq. ID No. 4689, Seq. ID No. 4691, Seq. ID No. 4693, Seq. ID No. 4697, Seq. ID No. 4699, Seq. ID No. 4701, Seq. ID No. 4703, Seq. ID No. 4713, Seq. ID No. 4719, Seq. ID No. 4721, Seq. ID No. 4723, Seq. ID No. 4725, Seq. ID No. 4727, Seq. ID No. 4729, Seq. ID No. 4731, Seq. ID No. 4733, Seq. ID No. 4735, Seq. ID No. 4739, Seq. ID No. 4741, Seq. ID No. 4743, Seq. ID No. 4745, Seq. ID No. 4747, Seq. ID No. 4749, Seq. ID No. 4751, Seq. ID No. 4753, Seq. ID No. 4755, Seq. ID No. 4757, Seq. ID No. 4761, Seq. ID No. 4763, Seq. ID No. 4765, Seq. ID No. 4767, Seq. ID No. 4769, Seq. ID No. 4771, Seq. ID No. 4773, Seq. ID No. 4775, Seq. ID No. 4777, Seq. ID No. 4779, Seq. ID No. 4781, Seq. ID No. 4783, Seq. ID No. 4785, Seq. ID No. 4787, Seq. ID No. 4789, Seq. ID No. 4791, Seq. ID No. 4793, Seq. ID No. 4795, Seq. ID No. 4797, Seq. ID No. 4799, Seq. ID No. 4801, Seq. ID No. 4803, Seq. ID No. 4805, Seq. ID No. 4807, Seq. ID No. 4809, Seq. ID No. 4811, Seq. ID No. 4815, Seq. ID No. 4817, Seq. ID No. 4819, Seq. ID No. 4821, Seq. ID No. 4823, Seq. ID No. 4825, Seq. ID No. 4829, Seq. ID No. 4831, Seq. ID No. 4833, Seq. ID No. 4835, Seq. ID No. 4837, Seq. ID No. 4839, Seq. ID No. 4841, Seq. ID No. 4843, Seq. ID No. 4845, Seq. ID No. 4847, Seq. ID No. 4849, Seq. ID No. 4851, Seq. ID No. 4855, Seq. ID No. 4857, Seq. ID No. 4859, Seq. ID No. 4861, Seq. ID No. 4865, Seq. ID No. 4867, Seq. ID No. 4877, Seq. ID No. 4879, Seq. ID No. 4881, Seq. ID No. 4883, Seq. ID No. 4885, Seq. ID No. 4887,

Seq. ID No. 4889, Seq. ID No. 4891, Seq. ID No. 4893, Seq. ID No. 4895, Seq. ID No. 4897, Seq. ID No. 4899, Seq. ID No. 4901, Seq. ID No. 4903, Seq. ID No. 4905, Seq. ID No. 4907, Seq. ID No. 4909, Seq. ID No. 4911, Seq. ID No. 4913, Seq. ID No. 4915, Seq. ID No. 4917, Seq. ID No. 4925, Seq. ID No. 4927, Seq. ID No. 4933, Seq. ID No. 4935, Seq. ID No. 4937, Seq. ID No. 4939, Seq. ID No. 4941, Seq. ID No. 4943, Seq. ID No. 4945, Seq. ID No. 4947, Seq. ID No. 4953, Seq. ID No. 4955, Seq. ID No. 4957, Seq. ID No. 4959, Seq. ID No. 4961, Seq. ID No. 4963, Seq. ID No. 4965, Seq. ID No. 4967, Seq. ID No. 4969, Seq. ID No. 4971, Seq. ID No. 4973, Seq. ID No. 4977, Seq. ID No. 4979, Seq. ID No. 4981, Seq. ID No. 4983, Seq. ID No. 4985, Seq. ID No. 4989, Seq. ID No. 4991, Seq. ID No. 4993, Seq. ID No. 4995, Seq. ID No. 4997, Seq. ID No. 5001, Seq. ID No. 5003, Seq. ID No. 5005, Seq. ID No. 5007, Seq. ID No. 5009, Seq. ID No. 5011, Seq. ID No. 5015, Seq. ID No. 5017, Seq. ID No. 5019, Seq. ID No. 5021, Seq. ID No. 5023, Seq. ID No. 5025, Seq. ID No. 5027, Seq. ID No. 5029, Seq. ID No. 5033, Seq. ID No. 5035, Seq. ID No. 5037, Seq. ID No. 5039, Seq. ID No. 5041, Seq. ID No. 5043, Seq. ID No. 5045, Seq. ID No. 5047, Seq. ID No. 5049, Seq. ID No. 5051, Seq. ID No. 5053, Seq. ID No. 5055, Seq. ID No. 5057, Seq. ID No. 5059, Seq. ID No. 5065, Seq. ID No. 5067, Seq. ID No. 5071, Seq. ID No. 5073, Seq. ID No. 5075, Seq. ID No. 5077, Seq. ID No. 5079, Seq. ID No. 5081, Seq. ID No. 5083, Seq. ID No. 5087, Seq. ID No. 5089, Seq. ID No. 5091, Seq. ID No. 5093, Seq. ID No. 5095, Seq. ID No. 5097, Seq. ID No. 5099, Seq. ID No. 5101, Seq. ID No. 5105, Seq. ID No. 5107, Seq. ID No. 5109, Seq. ID No. 5111, Seq. ID No. 5113, Seq. ID No. 5117, Seq. ID No. 5119, Seq. ID No. 5121, Seq. ID No. 5127, Seq. ID No. 5143, Seq. ID No. 5145, Seq. ID No. 5147, Seq. ID No. 5149, Seq. ID No. 5151, Seq. ID No. 5153, Seq. ID No. 5155, Seq. ID No. 5157, Seq. ID No. 5161, Seq. ID No. 5163, Seq. ID No. 5167, Seq. ID No. 5169, Seq. ID No. 5171, Seq. ID No. 5173, Seq. ID No. 5177, Seq. ID No. 5179, Seq. ID No. 5181, Seq. ID No. 5183, Seq. ID No. 5185, Seq. ID No. 5187, Seq. ID No. 5189, Seq. ID No. 5191, Seq. ID No. 5193, Seq. ID No. 5195, Seq. ID No. 5201, Seq. ID No. 5203, Seq. ID No. 5209, Seq. ID No. 5211, Seq. ID No. 5215, Seq. ID No. 5217, Seq. ID No. 5221, Seq. ID No. 5225, Seq. ID No. 5227, Seq. ID No. 5229, Seq. ID No. 5231, Seq. ID No. 5233, Seq. ID No. 5235, Seq. ID No. 5237, Seq. ID No. 5239, Seq. ID No. 5241, Seq. ID No. 5243, Seq. ID No. 5245, Seq. ID No. 5247, Seq. ID No. 5249, Seq. ID No. 5251, Seq. ID No. 5253, Seq. ID No. 5255, Seq. ID No. 5257, Seq. ID No. 5259, Seq. ID No. 5261, Seq. ID No. 5263, Seq. ID No. 5265, Seq. ID No. 5269, Seq. ID No. 5271,

Seq. ID No. 5283, Seq. ID No. 5287, Seq. ID No. 5289, Seq. ID No. 5291, Seq. ID No. 5293, Seq. ID No. 5295, Seq. ID No. 5297, Seq. ID No. 5299, Seq. ID No. 5301, Seq. ID No. 5303, Seq. ID No. 5305, Seq. ID No. 5307, Seq. ID No. 5309, Seq. ID No. 5311, Seq. ID No. 5313, Seq. ID No. 5315, Seq. ID No. 5317, Seq. ID No. 5319, Seq. ID No. 5321, Seq. ID No. 5323, Seq. ID No. 5325, Seq. ID No. 5333, Seq. ID No. 5335, Seq. ID No. 5337, Seq. ID No. 5339, Seq. ID No. 5343, Seq. ID No. 5345, Seq. ID No. 5347, Seq. ID No. 5349, Seq. ID No. 5351, Seq. ID No. 5353, Seq. ID No. 5355, Seq. ID No. 5357, Seq. ID No. 5359, Seq. ID No. 5361, Seq. ID No. 5363, Seq. ID No. 5365, Seq. ID No. 5367, Seq. ID No. 5369, Seq. ID No. 5371, Seq. ID No. 5373, Seq. ID No. 5375, Seq. ID No. 5381, Seq. ID No. 5383, Seq. ID No. 5389, Seq. ID No. 5391, Seq. ID No. 5393, Seq. ID No. 5395, Seq. ID No. 5397, Seq. ID No. 5399, Seq. ID No. 5401, Seq. ID No. 5403, Seq. ID No. 5407, Seq. ID No. 5409, Seq. ID No. 5411, Seq. ID No. 5417, Seq. ID No. 5419, Seq. ID No. 5421, Seq. ID No. 5423, Seq. ID No. 5425, Seq. ID No. 5427, Seq. ID No. 5429, Seq. ID No. 5431, Seq. ID No. 5435, Seq. ID No. 5437, Seq. ID No. 5439, Seq. ID No. 5441, Seq. ID No. 5443, Seq. ID No. 5445, Seq. ID No. 5447, Seq. ID No. 5449, Seq. ID No. 5451, Seq. ID No. 5455, Seq. ID No. 5457, Seq. ID No. 5467, Seq. ID No. 5469, Seq. ID No. 5471, Seq. ID No. 5473, Seq. ID No. 5475, Seq. ID No. 5477, Seq. ID No. 5479, Seq. ID No. 5481, Seq. ID No. 5483, Seq. ID No. 5485, Seq. ID No. 5487, Seq. ID No. 5489, Seq. ID No. 5493, Seq. ID No. 5495, Seq. ID No. 5499, Seq. ID No. 5501, Seq. ID No. 5503, Seq. ID No. 5505, Seq. ID No. 5507, Seq. ID No. 5511, Seq. ID No. 5519, Seq. ID No. 5521, Seq. ID No. 5523, Seq. ID No. 5527, Seq. ID No. 5535, Seq. ID No. 5537, Seq. ID No. 5539, Seq. ID No. 5541, Seq. ID No. 5547, Seq. ID No. 5549, Seq. ID No. 5551, Seq. ID No. 5553, Seq. ID No. 5555, Seq. ID No. 5557, Seq. ID No. 5559, Seq. ID No. 5561, Seq. ID No. 5563, Seq. ID No. 5565, Seq. ID No. 5567, Seq. ID No. 5571, Seq. ID No. 5573, Seq. ID No. 5575, Seq. ID No. 5577, Seq. ID No. 5579, Seq. ID No. 5581, Seq. ID No. 5583, Seq. ID No. 5585, Seq. ID No. 5599, Seq. ID No. 5601, Seq. ID No. 5603, Seq. ID No. 5605, Seq. ID No. 5607, Seq. ID No. 5613, Seq. ID No. 5615, Seq. ID No. 5617, Seq. ID No. 5619, Seq. ID No. 5627, Seq. ID No. 5629, Seq. ID No. 5631, Seq. ID No. 5635, Seq. ID No. 5645, Seq. ID No. 5647, Seq. ID No. 5651, Seq. ID No. 5653, Seq. ID No. 5655, Seq. ID No. 5657, Seq. ID No. 5661, Seq. ID No. 5663, Seq. ID No. 5665, Seq. ID No. 5669, Seq. ID No. 5671, Seq. ID No. 5673, Seq. ID No. 5675, Seq. ID No. 5677, Seq. ID No. 5679, Seq. ID No. 5691, Seq. ID No. 5693, Seq. ID No. 5695, Seq. ID No. 5697, Seq. ID No. 5701,

Seq. ID No. 5707, Seq. ID No. 5713, Seq. ID No. 5715, Seq. ID No. 5717, Seq. ID No. 5721, Seq. ID No. 5723, Seq. ID No. 5725, Seq. ID No. 5727, Seq. ID No. 5731, Seq. ID No. 5737, Seq. ID No. 5741, Seq. ID No. 5743, Seq. ID No. 5745, Seq. ID No. 5747, Seq. ID No. 5749, Seq. ID No. 5751, Seq. ID No. 5753, Seq. ID No. 5755, Seq. ID No. 5757, Seq. ID No. 5759, Seq. ID No. 5761, Seq. ID No. 5769, Seq. ID No. 5773, Seq. ID No. 5775, Seq. ID No. 5777, Seq. ID No. 5779, Seq. ID No. 5781, Seq. ID No. 5787, Seq. ID No. 5789, Seq. ID No. 5793, Seq. ID No. 5795, Seq. ID No. 5799, Seq. ID No. 5801, Seq. ID No. 5803, Seq. ID No. 5805, Seq. ID No. 5807, Seq. ID No. 5809, Seq. ID No. 5811, Seq. ID No. 5813, Seq. ID No. 5815, Seq. ID No. 5817, Seq. ID No. 5819, Seq. ID No. 5821, Seq. ID No. 5823, Seq. ID No. 5825, Seq. ID No. 5827, Seq. ID No. 5831, Seq. ID No. 5833, Seq. ID No. 5835, Seq. ID No. 5837, Seq. ID No. 5839, Seq. ID No. 5841, Seq. ID No. 5843, Seq. ID No. 5845, Seq. ID No. 5847, Seq. ID No. 5849, Seq. ID No. 5851, Seq. ID No. 5853, Seq. ID No. 5855, Seq. ID No. 5857, Seq. ID No. 5859, Seq. ID No. 5861, Seq. ID No. 5863, Seq. ID No. 5865, Seq. ID No. 5867, Seq. ID No. 5869, Seq. ID No. 5871, Seq. ID No. 5873, Seq. ID No. 5875, Seq. ID No. 5877, Seq. ID No. 5881, Seq. ID No. 5887, Seq. ID No. 5891, Seq. ID No. 5897, Seq. ID No. 5903, Seq. ID No. 5907, Seq. ID No. 5911, Seq. ID No. 5913, Seq. ID No. 5915, Seq. ID No. 5917, Seq. ID No. 5919, Seq. ID No. 5925, Seq. ID No. 5931, Seq. ID No. 5933, Seq. ID No. 5935, Seq. ID No. 5937, Seq. ID No. 5941, Seq. ID No. 5943, Seq. ID No. 5945, Seq. ID No. 5947, Seq. ID No. 5949, Seq. ID No. 5951, Seq. ID No. 5953, Seq. ID No. 5955, Seq. ID No. 5957, Seq. ID No. 5959, Seq. ID No. 5961, Seq. ID No. 5963, Seq. ID No. 5965, Seq. ID No. 5967, Seq. ID No. 5969, Seq. ID No. 5971, Seq. ID No. 5973, Seq. ID No. 5975, Seq. ID No. 5977, Seq. ID No. 5979, Seq. ID No. 5981, Seq. ID No. 5983, Seq. ID No. 5985, Seq. ID No. 5987, Seq. ID No. 5989, Seq. ID No. 5991, Seq. ID No. 5993, Seq. ID No. 5995, Seq. ID No. 5997, Seq. ID No. 5999, Seq. ID No. 6001, Seq. ID No. 6003, Seq. ID No. 6005, Seq. ID No. 6007, Seq. ID No. 6009, Seq. ID No. 6011, Seq. ID No. 6013, Seq. ID No. 6015, Seq. ID No. 6017, Seq. ID No. 6019, Seq. ID No. 6021, Seq. ID No. 6029, Seq. ID No. 6031, Seq. ID No. 6033, Seq. ID No. 6035, Seq. ID No. 6037, Seq. ID No. 6039, Seq. ID No. 6041, Seq. ID No. 6045, Seq. ID No. 6049, Seq. ID No. 6051, Seq. ID No. 6055, Seq. ID No. 6057, Seq. ID No. 6061, Seq. ID No. 6065, Seq. ID No. 6069, Seq. ID No. 6071, Seq. ID No. 6073, Seq. ID No. 6075, Seq. ID No. 6077, Seq. ID No. 6079, Seq. ID No. 6081, Seq. ID No. 6083, Seq. ID No. 6085, Seq. ID No. 6093, Seq. ID No. 6097, Seq. ID No. 6099, Seq. ID No. 6101,

Seq. ID No. 6105, Seq. ID No. 6113, Seq. ID No. 6119, Seq. ID No. 6121, Seq. ID No. 6123, Seq. ID No. 6125, Seq. ID No. 6127, Seq. ID No. 6129, Seq. ID No. 6131, Seq. ID No. 6133, Seq. ID No. 6139, Seq. ID No. 6141, Seq. ID No. 6143, Seq. ID No. 6145, Seq. ID No. 6147, Seq. ID No. 6149, Seq. ID No. 6151, Seq. ID No. 6153, Seq. ID No. 5 6155, Seq. ID No. 6157, Seq. ID No. 6167, Seq. ID No. 6171, Seq. ID No. 6173, Seq. ID No. 6175, Seq. ID No. 6177, Seq. ID No. 6179, Seq. ID No. 6181, Seq. ID No. 6193, Seq. ID No. 6195, Seq. ID No. 6199, Seq. ID No. 6201, Seq. ID No. 6207, Seq. ID No. 6211, Seq. ID No. 6213, Seq. ID No. 6215, Seq. ID No. 6219, Seq. ID No. 6231, Seq. ID No. 6233, Seq. ID No. 6239, Seq. ID No. 6247, Seq. ID No. 6251, Seq. ID No. 6255, 10 Seq. ID No. 6257, Seq. ID No. 6261, Seq. ID No. 6269, Seq. ID No. 6271, Seq. ID No. 6277, Seq. ID No. 6279, Seq. ID No. 6281, Seq. ID No. 6287, Seq. ID No. 6291, Seq. ID No. 6293, Seq. ID No. 6295, Seq. ID No. 6297, Seq. ID No. 6299, Seq. ID No. 6305, Seq. ID No. 6307, Seq. ID No. 6309, Seq. ID No. 6311, Seq. ID No. 6313, Seq. ID No. 6315, Seq. ID No. 6317, Seq. ID No. 6319, Seq. ID No. 6321, Seq. ID No. 6323, Seq. ID 15 No. 6329, Seq. ID No. 6331, Seq. ID No. 6333, Seq. ID No. 6335, Seq. ID No. 6337, Seq. ID No. 6339, Seq. ID No. 6341, Seq. ID No. 6343, Seq. ID No. 6345, Seq. ID No. 6347, Seq. ID No. 6349, Seq. ID No. 6351, Seq. ID No. 6353, Seq. ID No. 6355, Seq. ID No. 6357, Seq. ID No. 6359, Seq. ID No. 6361, Seq. ID No. 6367, Seq. ID No. 6369, Seq. ID No. 6371, Seq. ID No. 6373, Seq. ID No. 6375, Seq. ID No. 6379, Seq. ID No. 20 6385, Seq. ID No. 6387, Seq. ID No. 6389, Seq. ID No. 6391, Seq. ID No. 6393, Seq. ID No. 6395, Seq. ID No. 6397, Seq. ID No. 6399, Seq. ID No. 6401, Seq. ID No. 6403, Seq. ID No. 6405, Seq. ID No. 6407, Seq. ID No. 6409, Seq. ID No. 6411, Seq. ID No. 6413, Seq. ID No. 6417, Seq. ID No. 6419, Seq. ID No. 6421, Seq. ID No. 6423, Seq. ID No. 6433, Seq. ID No. 6435, Seq. ID No. 6437, Seq. ID No. 6439, Seq. ID No. 6441, 25 Seq. ID No. 6443, Seq. ID No. 6445, Seq. ID No. 6447, Seq. ID No. 6449, Seq. ID No. 6451, Seq. ID No. 6453, Seq. ID No. 6455, Seq. ID No. 6457, Seq. ID No. 6459, Seq. ID No. 6461, Seq. ID No. 6463, Seq. ID No. 6465, Seq. ID No. 6467, Seq. ID No. 6469, Seq. ID No. 6471, Seq. ID No. 6475, Seq. ID No. 6477, Seq. ID No. 6481, Seq. ID No. 6483, Seq. ID No. 6485, Seq. ID No. 6487, Seq. ID No. 6489, Seq. ID No. 6491, Seq. ID 30 No. 6493, Seq. ID No. 6495, Seq. ID No. 6499, Seq. ID No. 6501, Seq. ID No. 6503, Seq. ID No. 6505, Seq. ID No. 6507, Seq. ID No. 6509, Seq. ID No. 6511, Seq. ID No. 6513, Seq. ID No. 6515, Seq. ID No. 6519, Seq. ID No. 6521, Seq. ID No. 6523, Seq. ID No. 6525, Seq. ID No. 6527, Seq. ID No. 6529, Seq. ID No. 6531, Seq. ID No. 6533,

Seq. ID No. 6535, Seq. ID No. 6537, Seq. ID No. 6539, Seq. ID No. 6545, Seq. ID No. 6547, Seq. ID No. 6549, Seq. ID No. 6551, Seq. ID No. 6553, Seq. ID No. 6559, Seq. ID No. 6561, Seq. ID No. 6563, Seq. ID No. 6565, Seq. ID No. 6567, Seq. ID No. 6569, Seq. ID No. 6575, Seq. ID No. 6577, Seq. ID No. 6579, Seq. ID No. 6583, Seq. ID No. 6585, Seq. ID No. 6587, Seq. ID No. 6589, Seq. ID No. 6591, Seq. ID No. 6605, Seq. ID No. 6607, Seq. ID No. 6609, Seq. ID No. 6611, Seq. ID No. 6613, Seq. ID No. 6615, Seq. ID No. 6617, Seq. ID No. 6619, Seq. ID No. 6621, Seq. ID No. 6623, Seq. ID No. 6625, Seq. ID No. 6627, Seq. ID No. 6629, Seq. ID No. 6633, Seq. ID No. 6635, Seq. ID No. 6641, and Seq. ID No. 6647.

In yet another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a polypeptide, which was identified by BlastP analysis, and the polynucleotide is selected from one of Seq. ID No.9, Seq. ID No. 17, Seq. ID No. 45, Seq. ID No. 49, Seq. ID No. 53, Seq. ID No. 59, Seq. ID No. 89, Seq. ID No. 145, Seq. ID No. 157, Seq. ID No. 167, Seq. ID No. 171, Seq. ID No. 191, Seq. ID No. 215, Seq. ID No. 217, Seq. ID No. 225, Seq. ID No. 239, Seq. ID No. 253, Seq. ID No. 273, Seq. ID No. 277, Seq. ID No. 289, Seq. ID No. 329, Seq. ID No. 343, Seq. ID No. 345, Seq. ID No. 375, Seq. ID No. 501, Seq. ID No. 505, Seq. ID No. 511, Seq. ID No. 515, Seq. ID No. 529, Seq. ID No. 569, Seq. ID No. 575, Seq. ID No. 593, Seq. ID No. 595, Seq. ID No. 637, Seq. ID No. 659, Seq. ID No. 669, Seq. ID No. 675, Seq. ID No. 681, Seq. ID No. 729, Seq. ID No. 779, Seq. ID No. 819, Seq. ID No. 895, Seq. ID No. 921, Seq. ID No. 935, Seq. ID No. 955, Seq. ID No. 967, Seq. ID No. 985, Seq. ID No. 1017, Seq. ID No. 1039, Seq. ID No. 1075, Seq. ID No. 1089, Seq. ID No. 1137, Seq. ID No. 1223, Seq. ID No. 1241, Seq. ID No. 1315, Seq. ID No. 1331, Seq. ID No. 1369, Seq. ID No. 1459, Seq. ID No. 1517, Seq. ID No. 1561, Seq. ID No. 1563, Seq. ID No. 1567, Seq. ID No. 1571, Seq. ID No. 1573, Seq. ID No. 1601, Seq. ID No. 1607, Seq. ID No. 1613, Seq. ID No. 1619, Seq. ID No. 1641, Seq. ID No. 1647, Seq. ID No. 1653, Seq. ID No. 1657, Seq. ID No. 1665, Seq. ID No. 1699, Seq. ID No. 1713, Seq. ID No. 1751, Seq. ID No. 1771, Seq. ID No. 1785, Seq. ID No. 1789, Seq. ID No. 1791, Seq. ID No. 1797, Seq. ID No. 1811, Seq. ID No. 1817, Seq. ID No. 1819, Seq. ID No. 1821, Seq. ID No. 1871, Seq. ID No. 1895, Seq. ID No. 1905, Seq. ID No. 1913, Seq. ID No. 1919, Seq. ID No. 1923, Seq. ID No. 1965, Seq. ID No. 1971, Seq. ID No. 1999, Seq. ID No. 2047, Seq. ID No. 2055, Seq. ID No. 2091, Seq. ID No. 2093, Seq. ID No. 2115, Seq. ID No. 2119, Seq. ID No. 2127, Seq. ID No.

2165, Seq. ID No. 2179, Seq. ID No. 2207, Seq. ID No. 2223, Seq. ID No. 2227, Seq. ID No. 2241, Seq. ID No. 2253, Seq. ID No. 2263, Seq. ID No. 2269, Seq. ID No. 2275, Seq. ID No. 2301, Seq. ID No. 2315, Seq. ID No. 2329, Seq. ID No. 2333, Seq. ID No. 2343, Seq. ID No. 2345, Seq. ID No. 2363, Seq. ID No. 2373, Seq. ID No. 2391, Seq. ID No. 2417, Seq. ID No. 2429, Seq. ID No. 2465, Seq. ID No. 2475, Seq. ID No. 2483, Seq. ID No. 2513, Seq. ID No. 2525, Seq. ID No. 2589, Seq. ID No. 2613, Seq. ID No. 2651, Seq. ID No. 2669, Seq. ID No. 2677, Seq. ID No. 2687, Seq. ID No. 2689, Seq. ID No. 2693, Seq. ID No. 2703, Seq. ID No. 2709, Seq. ID No. 2715, Seq. ID No. 2751, Seq. ID No. 2753, Seq. ID No. 2767, Seq. ID No. 2787, Seq. ID No. 2791, Seq. ID No. 2803, Seq. ID No. 2867, Seq. ID No. 2871, Seq. ID No. 2907, Seq. ID No. 2919, Seq. ID No. 2921, Seq. ID No. 2923, Seq. ID No. 2927, Seq. ID No. 2933, Seq. ID No. 2957, Seq. ID No. 2979, Seq. ID No. 2999, Seq. ID No. 3005, Seq. ID No. 3019, Seq. ID No. 3031, Seq. ID No. 3035, Seq. ID No. 3055, Seq. ID No. 3067, Seq. ID No. 3085, Seq. ID No. 3165, Seq. ID No. 3183, Seq. ID No. 3189, Seq. ID No. 3197, Seq. ID No. 3211, Seq. ID No. 3251, Seq. ID No. 3257, Seq. ID No. 3259, Seq. ID No. 3297, Seq. ID No. 3319, Seq. ID No. 3323, Seq. ID No. 3335, Seq. ID No. 3337, Seq. ID No. 3355, Seq. ID No. 3359, Seq. ID No. 3377, Seq. ID No. 3397, Seq. ID No. 3405, Seq. ID No. 3415, Seq. ID No. 3425, Seq. ID No. 3427, Seq. ID No. 3461, Seq. ID No. 3463, Seq. ID No. 3487, Seq. ID No. 3493, Seq. ID No. 3497, Seq. ID No. 3507, Seq. ID No. 3519, Seq. ID No. 3521, Seq. ID No. 3529, Seq. ID No. 3535, Seq. ID No. 3629, Seq. ID No. 3635, Seq. ID No. 3727, Seq. ID No. 3759, Seq. ID No. 3771, Seq. ID No. 3793, Seq. ID No. 3839, Seq. ID No. 3851, Seq. ID No. 3863, Seq. ID No. 3865, Seq. ID No. 3883, Seq. ID No. 3891, Seq. ID No. 3913, Seq. ID No. 3925, Seq. ID No. 3929, Seq. ID No. 3975, Seq. ID No. 3981, Seq. ID No. 4027, Seq. ID No. 4039, Seq. ID No. 4061, Seq. ID No. 4073, Seq. ID No. 4081, Seq. ID No. 4103, Seq. ID No. 4111, Seq. ID No. 4137, Seq. ID No. 4225, Seq. ID No. 4247, Seq. ID No. 4343, Seq. ID No. 4379, Seq. ID No. 4389, Seq. ID No. 4469, Seq. ID No. 4473, Seq. ID No. 4481, Seq. ID No. 4485, Seq. ID No. 4493, Seq. ID No. 4529, Seq. ID No. 4643, Seq. ID No. 4705, Seq. ID No. 4713, Seq. ID No. 4717, Seq. ID No. 4813, Seq. ID No. 4815, Seq. ID No. 4825, Seq. ID No. 4827, Seq. ID No. 4833, Seq. ID No. 4837, Seq. ID No. 4851, Seq. ID No. 4863, Seq. ID No. 4875, Seq. ID No. 4879, Seq. ID No. 4893, Seq. ID No. 4901, Seq. ID No. 4919, Seq. ID No. 4931, Seq. ID No. 4959, Seq. ID No. 4963, Seq. ID No. 4985, Seq. ID No. 5113, Seq. ID No. 5115, Seq. ID No. 5117, Seq. ID No. 5125, Seq. ID No. 5141, Seq. ID No.



5183, Seq. ID No. 5201, Seq. ID No. 5205, Seq. ID No. 5213, Seq. ID No. 5219, Seq. ID No. 5279, Seq. ID No. 5285, Seq. ID No. 5331, Seq. ID No. 5381, Seq. ID No. 5389, Seq. ID No. 5405, Seq. ID No. 5411, Seq. ID No. 5419, Seq. ID No. 5433, Seq. ID No. 5463, Seq. ID No. 5477, Seq. ID No. 5491, Seq. ID No. 5509, Seq. ID No. 5513, Seq. ID No. 5525, Seq. ID No. 5529, Seq. ID No. 5537, Seq. ID No. 5567, Seq. ID No. 5599, Seq. ID No. 5621, Seq. ID No. 5637, Seq. ID No. 5699, Seq. ID No. 5723, Seq. ID No. 5733, Seq. ID No. 5761, Seq. ID No. 5791, Seq. ID No. 5895, Seq. ID No. 5901, Seq. ID No. 5903, Seq. ID No. 5909, Seq. ID No. 5913, Seq. ID No. 5919, Seq. ID No. 5929, Seq. ID No. 5939, Seq. ID No. 6001, Seq. ID No. 6043, Seq. ID No. 6053, Seq. ID No. 6057, Seq. ID No. 6089, Seq. ID No. 6095, Seq. ID No. 6103, Seq. ID No. 6111, Seq. ID No. 6117, Seq. ID No. 6165, Seq. ID No. 6169, Seq. ID No. 6185, Seq. ID No. 6191, Seq. ID No. 6209, Seq. ID No. 6229, Seq. ID No. 6257, Seq. ID No. 6263, Seq. ID No. 6271, Seq. ID No. 6275, Seq. ID No. 6289, Seq. ID No. 6303, Seq. ID No. 6365, Seq. ID No. 6369, Seq. ID No. 6383, and Seq. ID No. 6415.

In still yet another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloicoccus otitidis* genomic sequence encoding a polypeptide identified by Pfam analysis, and the polynucleotide is selected from one of Seq. ID No. 89, Seq. ID No. 145, Seq. ID No. 155, Seq. ID No. 167, Seq. ID No. 173, Seq. ID No. 191, Seq. ID No. 215, Seq. ID No. 219, Seq. ID No. 221, Seq. ID No. 223, Seq. ID No. 225, Seq. ID No. 233, Seq. ID No. 239, Seq. ID No. 251, Seq. ID No. 253, Seq. ID No. 271, Seq. ID No. 291, Seq. ID No. 331, Seq. ID No. 341, Seq. ID No. 345, Seq. ID No. 375, Seq. ID No. 501, Seq. ID No. 505, Seq. ID No. 511, Seq. ID No. 529, Seq. ID No. 567, Seq. ID No. 569, Seq. ID No. 575, Seq. ID No. 593, Seq. ID No. 595, Seq. ID No. 601, Seq. ID No. 637, Seq. ID No. 649, Seq. ID No. 661, Seq. ID No. 669, Seq. ID No. 675, Seq. ID No. 681, Seq. ID No. 683, Seq. ID No. 729, Seq. ID No. 753, Seq. ID No. 779, Seq. ID No. 827, Seq. ID No. 839, Seq. ID No. 895, Seq. ID No. 939, Seq. ID No. 969, Seq. ID No. 985, Seq. ID No. 1015, Seq. ID No. 1039, Seq. ID No. 1075, Seq. ID No. 1137, Seq. ID No. 1155, Seq. ID No. 1163, Seq. ID No. 1175, Seq. ID No. 1223, Seq. ID No. 1231, Seq. ID No. 1237, Seq. ID No. 1241, Seq. ID No. 1261, Seq. ID No. 1331, Seq. ID No. 1339, Seq. ID No. 1369, Seq. ID No. 1477, Seq. ID No. 1517, Seq. ID No. 1531, Seq. ID No. 1539, Seq. ID No. 1549, Seq. ID No. 1563, Seq. ID No. 1567, Seq. ID No. 1571, Seq. ID No. 1573, Seq. ID No. 1589, Seq. ID No. 1595, Seq. ID No. 1647, Seq. ID No. 1657, Seq. ID No. 1771, Seq. ID No. 1785, Seq. ID No. 1789, Seq. ID

No. 1819, Seq. ID No. 1821, Seq. ID No. 1969, Seq. ID No. 2015, Seq. ID No. 2047,  
Seq. ID No. 2087, Seq. ID No. 2089, Seq. ID No. 2093, Seq. ID No. 2115, Seq. ID No.  
2117, Seq. ID No. 2127, Seq. ID No. 2141, Seq. ID No. 2179, Seq. ID No. 2207, Seq. ID  
No. 2223, Seq. ID No. 2253, Seq. ID No. 2275, Seq. ID No. 2301, Seq. ID No. 2315,  
5 Seq. ID No. 2329, Seq. ID No. 2343, Seq. ID No. 2349, Seq. ID No. 2363, Seq. ID No.  
2381, Seq. ID No. 2391, Seq. ID No. 2417, Seq. ID No. 2421, Seq. ID No. 2423, Seq. ID  
No. 2429, Seq. ID No. 2481, Seq. ID No. 2487, Seq. ID No. 2489, Seq. ID No. 2491,  
Seq. ID No. 2509, Seq. ID No. 2519, Seq. ID No. 2525, Seq. ID No. 2547, Seq. ID No.  
2553, Seq. ID No. 2563, Seq. ID No. 2587, Seq. ID No. 2599, Seq. ID No. 2607, Seq. ID  
10 No. 2613, Seq. ID No. 2651, Seq. ID No. 2675, Seq. ID No. 2681, Seq. ID No. 2687,  
Seq. ID No. 2693, Seq. ID No. 2699, Seq. ID No. 2703, Seq. ID No. 2709, Seq. ID No.  
2711, Seq. ID No. 2727, Seq. ID No. 2753, Seq. ID No. 2819, Seq. ID No. 2821, Seq. ID  
No. 2823, Seq. ID No. 2867, Seq. ID No. 2871, Seq. ID No. 2907, Seq. ID No. 2919,  
Seq. ID No. 2957, Seq. ID No. 2971, Seq. ID No. 2979, Seq. ID No. 2999, Seq. ID No.  
15 3005, Seq. ID No. 3019, Seq. ID No. 3035, Seq. ID No. 3065, Seq. ID No. 3085, Seq. ID  
No. 3149, Seq. ID No. 3165, Seq. ID No. 3183, Seq. ID No. 3203, Seq. ID No. 3211,  
Seq. ID No. 3251, Seq. ID No. 3259, Seq. ID No. 3319, Seq. ID No. 3323, Seq. ID No.  
3335, Seq. ID No. 3337, Seq. ID No. 3347, Seq. ID No. 3359, Seq. ID No. 3377, Seq. ID  
No. 3379, Seq. ID No. 3399, Seq. ID No. 3425, Seq. ID No. 3483, Seq. ID No. 3495,  
20 Seq. ID No. 3497, Seq. ID No. 3519, Seq. ID No. 3529, Seq. ID No. 3599, Seq. ID No.  
3611, Seq. ID No. 3615, Seq. ID No. 3619, Seq. ID No. 3663, Seq. ID No. 3739, Seq. ID  
No. 3759, Seq. ID No. 3771, Seq. ID No. 3797, Seq. ID No. 3825, Seq. ID No. 3841,  
Seq. ID No. 3855, Seq. ID No. 3863, Seq. ID No. 3901, Seq. ID No. 3929, Seq. ID No.  
4015, Seq. ID No. 4017, Seq. ID No. 4055, Seq. ID No. 4075, Seq. ID No. 4085, Seq. ID  
25 No. 4089, Seq. ID No. 4099, Seq. ID No. 4105, Seq. ID No. 4129, Seq. ID No. 4203,  
Seq. ID No. 4243, Seq. ID No. 4251, Seq. ID No. 4343, Seq. ID No. 4383, Seq. ID No.  
4475, Seq. ID No. 4481, Seq. ID No. 4487, Seq. ID No. 4491, Seq. ID No. 4533, Seq. ID  
No. 4627, Seq. ID No. 4705, Seq. ID No. 4713, Seq. ID No. 4717, Seq. ID No. 4719,  
Seq. ID No. 4729, Seq. ID No. 4789, Seq. ID No. 4791, Seq. ID No. 4793, Seq. ID No.  
30 4803, Seq. ID No. 4813, Seq. ID No. 4815, Seq. ID No. 4825, Seq. ID No. 4833, Seq. ID  
No. 4837, Seq. ID No. 4875, Seq. ID No. 4879, Seq. ID No. 4919, Seq. ID No. 4931,  
Seq. ID No. 4947, Seq. ID No. 4985, Seq. ID No. 5077, Seq. ID No. 5115, Seq. ID No.  
5117, Seq. ID No. 5127, Seq. ID No. 5141, Seq. ID No. 5193, Seq. ID No. 5215, Seq. ID

No. 5219, Seq. ID No. 5275, Seq. ID No. 5381, Seq. ID No. 5389, Seq. ID No. 5409, Seq. ID No. 5411, Seq. ID No. 5475, Seq. ID No. 5491, Seq. ID No. 5513, Seq. ID No. 5519, Seq. ID No. 5525, Seq. ID No. 5529, Seq. ID No. 5537, Seq. ID No. 5557, Seq. ID No. 5581, Seq. ID No. 5599, Seq. ID No. 5637, Seq. ID No. 5685, Seq. ID No. 5723, Seq. ID No. 5755, Seq. ID No. 5761, Seq. ID No. 5895, Seq. ID No. 5901, Seq. ID No. 5903, Seq. ID No. 5911, Seq. ID No. 5913, Seq. ID No. 5919, Seq. ID No. 5923, Seq. ID No. 5929, Seq. ID No. 6001, Seq. ID No. 6043, Seq. ID No. 6053, Seq. ID No. 6055, Seq. ID No. 6089, Seq. ID No. 6095, Seq. ID No. 6111, Seq. ID No. 6117, Seq. ID No. 6165, Seq. ID No. 6169, Seq. ID No. 6187, Seq. ID No. 6195, Seq. ID No. 6219, Seq. ID No. 6233, Seq. ID No. 6269, Seq. ID No. 6275, Seq. ID No. 6279, Seq. ID No. 6287, Seq. ID No. 6297, Seq. ID No. 6299, Seq. ID No. 6305, Seq. ID No. 6311, Seq. ID No. 6369, Seq. ID No. 6379, Seq. ID No. 6587, and Seq. ID No. 6591.

In another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a polypeptide, and which has been identified using the proteomic methods used for studying surface proteins of *Streptococcus pneumoniae*, and the polynucleotide is selected from one of Seq. ID No. 1, Seq. ID No. 5, Seq. ID No. 93, Seq. ID No. 95, Seq. ID No. 103, Seq. ID No. 107, Seq. ID No. 157, Seq. ID No. 223, Seq. ID No. 225, Seq. ID No. 233, Seq. ID No. 239, Seq. ID No. 253, Seq. ID No. 317, Seq. ID No. 321, Seq. ID No. 341, Seq. ID No. 345, Seq. ID No. 353, Seq. ID No. 361, Seq. ID No. 363, Seq. ID No. 365, Seq. ID No. 375, Seq. ID No. 379, Seq. ID No. 383, Seq. ID No. 389, Seq. ID No. 391, Seq. ID No. 397, Seq. ID No. 405, Seq. ID No. 409, Seq. ID No. 415, Seq. ID No. 423, Seq. ID No. 425, Seq. ID No. 427, Seq. ID No. 429, Seq. ID No. 435, Seq. ID No. 437, Seq. ID No. 439, Seq. ID No. 441, Seq. ID No. 443, Seq. ID No. 445, Seq. ID No. 447, Seq. ID No. 449, Seq. ID No. 461, Seq. ID No. 463, Seq. ID No. 465, Seq. ID No. 513, Seq. ID No. 543, Seq. ID No. 551, Seq. ID No. 553, Seq. ID No. 559, Seq. ID No. 595, Seq. ID No. 601, Seq. ID No. 637, Seq. ID No. 649, Seq. ID No. 657, Seq. ID No. 669, Seq. ID No. 675, Seq. ID No. 683, Seq. ID No. 753, Seq. ID No. 929, Seq. ID No. 969, Seq. ID No. 1041, Seq. ID No. 1043, Seq. ID No. 1085, Seq. ID No. 1089, Seq. ID No. 1093, Seq. ID No. 1097, Seq. ID No. 1099, Seq. ID No. 1101, Seq. ID No. 1175, Seq. ID No. 1205, Seq. ID No. 1237, Seq. ID No. 1459, Seq. ID No. 1495, Seq. ID No. 1497, Seq. ID No. 1503, Seq. ID No. 1517, Seq. ID No. 1527, Seq. ID No. 1531, Seq. ID No. 1539, Seq. ID No. 1543, Seq. ID No. 1549, Seq. ID No. 1573, Seq. ID No. 1657, Seq. ID No.

1709, Seq. ID No. 1767, Seq. ID No. 1785, Seq. ID No. 1821, Seq. ID No. 1889, Seq. ID  
No. 1925, Seq. ID No. 1969, Seq. ID No. 2003, Seq. ID No. 2047, Seq. ID No. 2075,  
Seq. ID No. 2089, Seq. ID No. 2093, Seq. ID No. 2117, Seq. ID No. 2137, Seq. ID No.  
2143, Seq. ID No. 2205, Seq. ID No. 2235, Seq. ID No. 2257, Seq. ID No. 2301, Seq. ID  
5 No. 2363, Seq. ID No. 2423, Seq. ID No. 2445, Seq. ID No. 2451, Seq. ID No. 2481,  
Seq. ID No. 2495, Seq. ID No. 2505, Seq. ID No. 2577, Seq. ID No. 2587, Seq. ID No.  
2613, Seq. ID No. 2633, Seq. ID No. 2651, Seq. ID No. 2665, Seq. ID No. 2669, Seq. ID  
No. 2677, Seq. ID No. 2687, Seq. ID No. 2693, Seq. ID No. 2699, Seq. ID No. 2711,  
Seq. ID No. 2715, Seq. ID No. 2757, Seq. ID No. 2791, Seq. ID No. 2793, Seq. ID No.  
10 2803, Seq. ID No. 2867, Seq. ID No. 2919, Seq. ID No. 2929, Seq. ID No. 3005, Seq. ID  
No. 3019, Seq. ID No. 3125, Seq. ID No. 3137, Seq. ID No. 3161, Seq. ID No. 3179,  
Seq. ID No. 3251, Seq. ID No. 3259, Seq. ID No. 3285, Seq. ID No. 3309, Seq. ID No.  
3317, Seq. ID No. 3337, Seq. ID No. 3345, Seq. ID No. 3359, Seq. ID No. 3475, Seq. ID  
No. 3515, Seq. ID No. 3521, Seq. ID No. 3641, Seq. ID No. 3695, Seq. ID No. 3793,  
15 Seq. ID No. 3901, Seq. ID No. 3927, Seq. ID No. 3987, Seq. ID No. 4001, Seq. ID No.  
4057, Seq. ID No. 4081, Seq. ID No. 4111, Seq. ID No. 4125, Seq. ID No. 4193, Seq. ID  
No. 4195, Seq. ID No. 4237, Seq. ID No. 4247, Seq. ID No. 4383, Seq. ID No. 4393,  
Seq. ID No. 4397, Seq. ID No. 4401, Seq. ID No. 4435, Seq. ID No. 4449, Seq. ID No.  
4471, Seq. ID No. 4491, Seq. ID No. 4511, Seq. ID No. 4519, Seq. ID No. 4531, Seq. ID  
20 No. 4549, Seq. ID No. 4577, Seq. ID No. 4581, Seq. ID No. 4585, Seq. ID No. 4609,  
Seq. ID No. 4611, Seq. ID No. 4613, Seq. ID No. 4675, Seq. ID No. 4685, Seq. ID No.  
4719, Seq. ID No. 4729, Seq. ID No. 4743, Seq. ID No. 4755, Seq. ID No. 4781, Seq. ID  
No. 4787, Seq. ID No. 4837, Seq. ID No. 4841, Seq. ID No. 4849, Seq. ID No. 4855,  
Seq. ID No. 4889, Seq. ID No. 4901, Seq. ID No. 4915, Seq. ID No. 4917, Seq. ID No.  
25 4931, Seq. ID No. 4935, Seq. ID No. 4977, Seq. ID No. 5025, Seq. ID No. 5029, Seq. ID  
No. 5109, Seq. ID No. 5115, Seq. ID No. 5117, Seq. ID No. 5155, Seq. ID No. 5185,  
Seq. ID No. 5201, Seq. ID No. 5203, Seq. ID No. 5219, Seq. ID No. 5261, Seq. ID No.  
5289, Seq. ID No. 5295, Seq. ID No. 5377, Seq. ID No. 5389, Seq. ID No. 5399, Seq. ID  
No. 5411, Seq. ID No. 5537, Seq. ID No. 5621, Seq. ID No. 5627, Seq. ID No. 5657,  
30 Seq. ID No. 5675, Seq. ID No. 5717, Seq. ID No. 5777, Seq. ID No. 5859, Seq. ID No.  
5901, Seq. ID No. 5913, Seq. ID No. 5919, Seq. ID No. 5925, Seq. ID No. 5933, Seq. ID  
No. 6055, Seq. ID No. 6129, Seq. ID No. 6133, Seq. ID No. 6187, Seq. ID No. 6193,

Seq. ID No. 6219, Seq. ID No. 6271, Seq. ID No. 6277, Seq. ID No. 6369, Seq. ID No. 6375, Seq. ID No. 6379, Seq. ID No. 6389, Seq. ID No. 6591, and Seq. ID No. 6605.

In another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a polypeptide, wherein the polypeptide encoded by the polynucleotide was identified using HMM LPXTG motif finder as having a LPXTG motif, and wherein the polypeptide is covalently attached to the peptidoglycan layer, and the polynucleotide is selected from one Seq. ID No. 503, Seq. ID No. 505, Seq. ID No. 1315, Seq. ID No. 1317, Seq. ID No. 1363, Seq. ID No. 1365, Seq. ID No. 1367, Seq. ID No. 1369, Seq. ID No. 1559, Seq. ID No. 1561, Seq. ID No. 1581, Seq. ID No. 1739, Seq. ID No. 1741, Seq. ID No. 2811, Seq. ID No. 2813, Seq. ID No. 3619, Seq. ID No. 5587, Seq. ID No. 5589, Seq. ID No. 5591, Seq. ID No. 5781, Seq. ID No. 5783, and Seq. ID No. 6103.

In another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a lipoprotein as predicted by HMM Lipo software program, and the polynucleotide is selected from Seq. ID No. 45, Seq. ID No. 47, Seq. ID No. 171, Seq. ID No. 225, Seq. ID No. 419, Seq. ID No. 513, Seq. ID No. 575, Seq. ID No. 591, Seq. ID No. 593, Seq. ID No. 657, Seq. ID No. 659, Seq. ID No. 669, Seq. ID No. 675, Seq. ID No. 745, Seq. ID No. 747, Seq. ID No. 935, Seq. ID No. 1045, Seq. ID No. 1075, Seq. ID No. 1137, Seq. ID No. 1173, Seq. ID No. 1191, Seq. ID No. 1193, Seq. ID No. 1195, Seq. ID No. 1563, Seq. ID No. 1661, Seq. ID No. 1663, Seq. ID No. 1665, Seq. ID No. 1791, Seq. ID No. 1797, Seq. ID No. 1917, Seq. ID No. 1969, Seq. ID No. 2115, Seq. ID No. 2159, Seq. ID No. 2429, Seq. ID No. 2527, Seq. ID No. 2699, Seq. ID No. 2815, Seq. ID No. 2875, Seq. ID No. 2975, Seq. ID No. 2977, Seq. ID No. 2991, Seq. ID No. 3043, Seq. ID No. 3323, Seq. ID No. 3337, Seq. ID No. 4133, Seq. ID No. 4137, Seq. ID No. 4481, Seq. ID No. 4705, Seq. ID No. 4827, Seq. ID No. 4869, Seq. ID No. 5115, Seq. ID No. 5377, Seq. ID No. 5379, Seq. ID No. 5491, Seq. ID No. 5509, Seq. ID No. 5513, Seq. ID No. 5525, Seq. ID No. 5529, Seq. ID No. 5531, Seq. ID No. 5889, Seq. ID No. 5909, Seq. ID No. 6025, Seq. ID No. 6027, Seq. ID No. 6087, Seq. ID No. 6089, Seq. ID No. 6325, Seq. ID No. 6327, Seq. ID No. 6415, Seq. ID No. 6637, Seq. ID No. 6639, and Seq. ID No. 6645.

In another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a polypeptide, wherein the polypeptide encoded by the polynucleotide is predicted by HMM program to

be non-covalently bound to the peptidoglycan layer, and the polynucleotide is selected from Seq. ID No. 3589, Seq. ID No. 3987, Seq. ID No. 5219, and Seq. ID No. 5337.

In another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a polypeptide, wherein the polypeptide encodes a polypeptide having a RGD<sub>X</sub> motif wherein X is not a proline, and the polynucleotide is selected from Seq. ID No. 37, Seq. ID No. 99, Seq. ID No. 107, Seq. ID No. 109, Seq. ID No. 111, Seq. ID No. 351, Seq. ID No. 353, Seq. ID No. 465, Seq. ID No. 467, Seq. ID No. 469, Seq. ID No. 471, Seq. ID No. 683, Seq. ID No. 821, Seq. ID No. 823, Seq. ID No. 1021, Seq. ID No. 1023, Seq. ID No. 1157, Seq. ID No. 1159, Seq. ID No. 1233, Seq. ID No. 1333, Seq. ID No. 1335, Seq. ID No. 1449, Seq. ID No. 1559, Seq. ID No. 1561, Seq. ID No. 1563, Seq. ID No. 1625, Seq. ID No. 1777, Seq. ID No. 1827, Seq. ID No. 1829, Seq. ID No. 1871, Seq. ID No. 1925, Seq. ID No. 2135, Seq. ID No. 2145, Seq. ID No. 2173, Seq. ID No. 2175, Seq. ID No. 2177, Seq. ID No. 2179, Seq. ID No. 2259, Seq. ID No. 2317, Seq. ID No. 2319, Seq. ID No. 2321, Seq. ID No. 2323, Seq. ID No. 2325, Seq. ID No. 2327, Seq. ID No. 2329, Seq. ID No. 2401, Seq. ID No. 2671, Seq. ID No. 2863, Seq. ID No. 2869, Seq. ID No. 2919, Seq. ID No. 2921, Seq. ID No. 2993, Seq. ID No. 3087, Seq. ID No. 3137, Seq. ID No. 3279, Seq. ID No. 3281, Seq. ID No. 3283, Seq. ID No. 3333, Seq. ID No. 3335, Seq. ID No. 3497, Seq. ID No. 3499, Seq. ID No. 3501, Seq. ID No. 3533, Seq. ID No. 3671, Seq. ID No. 3673, Seq. ID No. 3675, Seq. ID No. 3837, Seq. ID No. 3839, Seq. ID No. 3841, Seq. ID No. 3843, Seq. ID No. 3929, Seq. ID No. 3961, Seq. ID No. 4037, Seq. ID No. 4193, Seq. ID No. 4239, Seq. ID No. 4327, Seq. ID No. 4329, Seq. ID No. 4333, Seq. ID No. 4393, Seq. ID No. 4463, Seq. ID No. 4465, Seq. ID No. 4467, Seq. ID No. 4597, Seq. ID No. 4629, Seq. ID No. 4631, Seq. ID No. 4675, Seq. ID No. 4677, Seq. ID No. 4679, Seq. ID No. 4689, Seq. ID No. 4691, Seq. ID No. 4693, Seq. ID No. 4781, Seq. ID No. 4799, Seq. ID No. 4801, Seq. ID No. 4803, Seq. ID No. 4861, Seq. ID No. 5009, Seq. ID No. 5143, Seq. ID No. 5145, Seq. ID No. 5179, Seq. ID No. 5181, Seq. ID No. 5183, Seq. ID No. 5249, Seq. ID No. 5251, Seq. ID No. 5253, Seq. ID No. 5259, Seq. ID No. 5261, Seq. ID No. 5293, Seq. ID No. 5295, Seq. ID No. 5297, Seq. ID No. 5299, Seq. ID No. 5307, Seq. ID No. 5309, Seq. ID No. 5411, Seq. ID No. 5535, Seq. ID No. 5537, Seq. ID No. 5745, Seq. ID No. 5821, Seq. ID No. 5823, Seq. ID No. 5825, Seq. ID No. 6029, Seq. ID No. 6171, Seq. ID No. 6307, Seq. ID No. 6309, and Seq. ID No. 6311.

In another preferred embodiment, the polynucleotide is selected from the *Alloiococcus otitidis* polynucleotides that are predicted by BlastP analysis as encoding polypeptides involved in capsule biosynthesis and transport, and the polynucleotide is selected from Seq. ID No. 49, Seq. ID No. 51, Seq. ID No. 53, Seq. ID No. 59, Seq. ID No. 195, Seq. ID No. 689, Seq. ID No. 703, Seq. ID No. 925, Seq. ID No. 1597, Seq. ID No. 1601, Seq. ID No. 1607, Seq. ID No. 1611, Seq. ID No. 1613, Seq. ID No. 1713, Seq. ID No. 2029, Seq. ID No. 2263, Seq. ID No. 2269, Seq. ID No. 2373, Seq. ID No. 2437, Seq. ID No. 2651, Seq. ID No. 2767, Seq. ID No. 2907, Seq. ID No. 3397, Seq. ID No. 3399, Seq. ID No. 3479, Seq. ID No. 3487, Seq. ID No. 3491, Seq. ID No. 3493, Seq. ID No. 3495, Seq. ID No. 3497, Seq. ID No. 3519, Seq. ID No. 3521, Seq. ID No. 3529, Seq. ID No. 3535, Seq. ID No. 3561, Seq. ID No. 3883, Seq. ID No. 3891, Seq. ID No. 3981, and Seq. ID No. 4087.

In yet another preferred embodiment, the polynucleotide is selected from the *Alloiococcus otitidis* polynucleotides that encodes a polypeptide identified by BlastP analysis as being localized within the capsular loci of the *Alloiococcus otitidis* genome, and the polynucleotide is selected from one of Seq. ID No. 45, Seq. ID No. 47, Seq. ID No. 51, Seq. ID No. 53, Seq. ID No. 55, Seq. ID No. 57, Seq. ID No. 59, Seq. ID No. 683, Seq. ID No. 685, Seq. ID No. 687, Seq. ID No. 689, Seq. ID No. 691, Seq. ID No. 693, Seq. ID No. 695, Seq. ID No. 697, Seq. ID No. 699, Seq. ID No. 701, Seq. ID No. 703, Seq. ID No. 705, Seq. ID No. 707, Seq. ID No. 709, Seq. ID No. 711, Seq. ID No. 713, Seq. ID No. 715, Seq. ID No. 717, Seq. ID No. 719, Seq. ID No. 721, Seq. ID No. 723, Seq. ID No. 725, Seq. ID No. 727, Seq. ID No. 729, Seq. ID No. 731, Seq. ID No. 733, Seq. ID No. 735, Seq. ID No. 737, Seq. ID No. 739, Seq. ID No. 741, Seq. ID No. 743, Seq. ID No. 745, Seq. ID No. 747, Seq. ID No. 749, Seq. ID No. 751, Seq. ID No. 753, Seq. ID No. 3389, Seq. ID No. 3391, Seq. ID No. 3393, Seq. ID No. 3395, Seq. ID No. 3397, Seq. ID No. 3399, Seq. ID No. 3401, Seq. ID No. 3403, Seq. ID No. 3405, Seq. ID No. 3407, Seq. ID No. 3409, Seq. ID No. 3411, Seq. ID No. 3413, Seq. ID No. 3415, Seq. ID No. 3417, Seq. ID No. 3419, Seq. ID No. 3421, Seq. ID No. 3423, Seq. ID No. 3425, Seq. ID No. 3427, Seq. ID No. 3429, Seq. ID No. 3431, Seq. ID No. 3433, Seq. ID No. 3435, Seq. ID No. 3437, Seq. ID No. 3439, Seq. ID No. 3441, Seq. ID No. 3443, Seq. ID No. 3445, Seq. ID No. 3447, Seq. ID No. 3449, Seq. ID No. 3451, Seq. ID No. 3453, Seq. ID No. 3455, Seq. ID No. 3457, Seq. ID No. 3459, Seq. ID No. 3461, Seq. ID No. 3463, Seq. ID No. 3465, Seq. ID No. 3467, Seq. ID No. 3469, Seq. ID No. 3471,

Seq. ID No. 3473, Seq. ID No. 3475, Seq. ID No. 3477, Seq. ID No. 3479, Seq. ID No. 3481, Seq. ID No. 3483, Seq. ID No. 3485, Seq. ID No. 3487, Seq. ID No. 3489, Seq. ID No. 3491, Seq. ID No. 3493, Seq. ID No. 3495, Seq. ID No. 3497, Seq. ID No. 3499, Seq. ID No. 3501, Seq. ID No. 3503, Seq. ID No. 3505, Seq. ID No. 3507, Seq. ID No. 3509, Seq. ID No. 3511, Seq. ID No. 3513, Seq. ID No. 3515, Seq. ID No. 3517, Seq. ID No. 3519, Seq. ID No. 3521, Seq. ID No. 3523, Seq. ID No. 3525, Seq. ID No. 3527, Seq. ID No. 3529, Seq. ID No. 3531, Seq. ID No. 3533, Seq. ID No. 3535, Seq. ID No. 3537, Seq. ID No. 3539, Seq. ID No. 3541, Seq. ID No. 3543, Seq. ID No. 3545, Seq. ID No. 3547, Seq. ID No. 3549, Seq. ID No. 3551, Seq. ID No. 3553, Seq. ID No. 3555, Seq. ID No. 3557, Seq. ID No. 3559, and Seq. ID No. 3561.

In another preferred embodiment, the polynucleotide is selected from the *Alloiococcus otitidis* polynucleotides identified by BlastP analysis as encoding polypeptides, which are associated with sporulation, and the polynucleotide is selected from one of Seq. ID No. 1137, Seq. ID No. 1455, Seq. ID No. 2137, Seq. ID No. 2141, Seq. ID No. 2165, Seq. ID No. 2179, Seq. ID No. 2301, Seq. ID No. 2753, Seq. ID No. 4211, Seq. ID No. 4251, Seq. ID No. 4327, Seq. ID No. 4569, Seq. ID No. 4719, and Seq. ID No. 4729.

In another preferred embodiment, the polynucleotide is selected from the *Alloiococcus otitidis* polynucleotides identified by BlastP analysis as being unique and having a BlastP 'E' value of  $> e^{-10}$ , and the polynucleotide is selected from one of Seq. ID No. 7, Seq. ID No. 19, Seq. ID No. 21, Seq. ID No. 23, Seq. ID No. 31, Seq. ID No. 39, Seq. ID No. 65, Seq. ID No. 67, Seq. ID No. 69, Seq. ID No. 91, Seq. ID No. 99, Seq. ID No. 105, Seq. ID No. 113, Seq. ID No. 115, Seq. ID No. 123, Seq. ID No. 125, Seq. ID No. 127, Seq. ID No. 131, Seq. ID No. 133, Seq. ID No. 139, Seq. ID No. 151, Seq. ID No. 159, Seq. ID No. 161, Seq. ID No. 163, Seq. ID No. 165, Seq. ID No. 169, Seq. ID No. 185, Seq. ID No. 189, Seq. ID No. 193, Seq. ID No. 229, Seq. ID No. 231, Seq. ID No. 255, Seq. ID No. 257, Seq. ID No. 259, Seq. ID No. 275, Seq. ID No. 337, Seq. ID No. 339, Seq. ID No. 347, Seq. ID No. 349, Seq. ID No. 357, Seq. ID No. 359, Seq. ID No. 369, Seq. ID No. 371, Seq. ID No. 377, Seq. ID No. 385, Seq. ID No. 387, Seq. ID No. 393, Seq. ID No. 399, Seq. ID No. 401, Seq. ID No. 403, Seq. ID No. 407, Seq. ID No. 419, Seq. ID No. 431, Seq. ID No. 477, Seq. ID No. 495, Seq. ID No. 507, Seq. ID No. 519, Seq. ID No. 541, Seq. ID No. 545, Seq. ID No. 547, Seq. ID No. 549, Seq. ID No. 557, Seq. ID No. 589, Seq. ID No. 617, Seq. ID No. 619, Seq. ID No. 633, Seq. ID



No. 639, Seq. ID No. 641, Seq. ID No. 643, Seq. ID No. 645, Seq. ID No. 647, Seq. ID  
No. 651, Seq. ID No. 653, Seq. ID No. 655, Seq. ID No. 667, Seq. ID No. 691, Seq. ID  
No. 693, Seq. ID No. 695, Seq. ID No. 697, Seq. ID No. 715, Seq. ID No. 717, Seq. ID  
No. 719, Seq. ID No. 731, Seq. ID No. 733, Seq. ID No. 741, Seq. ID No. 743, Seq. ID  
5 No. 745, Seq. ID No. 747, Seq. ID No. 749, Seq. ID No. 751, Seq. ID No. 755, Seq. ID  
No. 757, Seq. ID No. 759, Seq. ID No. 761, Seq. ID No. 763, Seq. ID No. 765, Seq. ID  
No. 767, Seq. ID No. 801, Seq. ID No. 803, Seq. ID No. 805, Seq. ID No. 807, Seq. ID  
No. 809, Seq. ID No. 811, Seq. ID No. 813, Seq. ID No. 833, Seq. ID No. 841, Seq. ID  
No. 849, Seq. ID No. 851, Seq. ID No. 853, Seq. ID No. 855, Seq. ID No. 887, Seq. ID  
10 No. 889, Seq. ID No. 891, Seq. ID No. 903, Seq. ID No. 905, Seq. ID No. 909, Seq. ID  
No. 937, Seq. ID No. 941, Seq. ID No. 943, Seq. ID No. 951, Seq. ID No. 957, Seq. ID  
No. 973, Seq. ID No. 975, Seq. ID No. 987, Seq. ID No. 1005, Seq. ID No. 1007, Seq. ID  
No. 1009, Seq. ID No. 1011, Seq. ID No. 1019, Seq. ID No. 1025, Seq. ID No. 1027,  
Seq. ID No. 1045, Seq. ID No. 1047, Seq. ID No. 1071, Seq. ID No. 1073, Seq. ID No.  
15 1077, Seq. ID No. 1105, Seq. ID No. 1107, Seq. ID No. 1111, Seq. ID No. 1131, Seq. ID  
No. 1135, Seq. ID No. 1139, Seq. ID No. 1151, Seq. ID No. 1153, Seq. ID No. 1165,  
Seq. ID No. 1167, Seq. ID No. 1169, Seq. ID No. 1171, Seq. ID No. 1173, Seq. ID No.  
1181, Seq. ID No. 1183, Seq. ID No. 1185, Seq. ID No. 1187, Seq. ID No. 1189, Seq. ID  
No. 1191, Seq. ID No. 1193, Seq. ID No. 1195, Seq. ID No. 1197, Seq. ID No. 1199,  
20 Seq. ID No. 1201, Seq. ID No. 1203, Seq. ID No. 1207, Seq. ID No. 1213, Seq. ID No.  
1227, Seq. ID No. 1229, Seq. ID No. 1239, Seq. ID No. 1243, Seq. ID No. 1245, Seq. ID  
No. 1247, Seq. ID No. 1249, Seq. ID No. 1259, Seq. ID No. 1265, Seq. ID No. 1267,  
Seq. ID No. 1269, Seq. ID No. 1271, Seq. ID No. 1273, Seq. ID No. 1275, Seq. ID No.  
1277, Seq. ID No. 1279, Seq. ID No. 1281, Seq. ID No. 1283, Seq. ID No. 1285, Seq. ID  
25 No. 1287, Seq. ID No. 1289, Seq. ID No. 1291, Seq. ID No. 1293, Seq. ID No. 1295,  
Seq. ID No. 1297, Seq. ID No. 1299, Seq. ID No. 1301, Seq. ID No. 1303, Seq. ID No.  
1305, Seq. ID No. 1307, Seq. ID No. 1309, Seq. ID No. 1311, Seq. ID No. 1313, Seq. ID  
No. 1319, Seq. ID No. 1321, Seq. ID No. 1323, Seq. ID No. 1325, Seq. ID No. 1327,  
Seq. ID No. 1337, Seq. ID No. 1341, Seq. ID No. 1343, Seq. ID No. 1347, Seq. ID No.  
30 1349, Seq. ID No. 1351, Seq. ID No. 1353, Seq. ID No. 1355, Seq. ID No. 1371, Seq. ID  
No. 1379, Seq. ID No. 1381, Seq. ID No. 1389, Seq. ID No. 1397, Seq. ID No. 1399,  
Seq. ID No. 1401, Seq. ID No. 1417, Seq. ID No. 1419, Seq. ID No. 1421, Seq. ID No.  
1423, Seq. ID No. 1439, Seq. ID No. 1445, Seq. ID No. 1447, Seq. ID No. 1457, Seq. ID

No. 1465, Seq. ID No. 1479, Seq. ID No. 1511, Seq. ID No. 1551, Seq. ID No. 1553, Seq. ID No. 1555, Seq. ID No. 1557, Seq. ID No. 1579, Seq. ID No. 1609, Seq. ID No. 1621, Seq. ID No. 1623, Seq. ID No. 1625, Seq. ID No. 1627, Seq. ID No. 1629, Seq. ID No. 1631, Seq. ID No. 1633, Seq. ID No. 1639, Seq. ID No. 1643, Seq. ID No. 1655, Seq. ID No. 1667, Seq. ID No. 1671, Seq. ID No. 1693, Seq. ID No. 1695, Seq. ID No. 1701, Seq. ID No. 1703, Seq. ID No. 1705, Seq. ID No. 1721, Seq. ID No. 1723, Seq. ID No. 1731, Seq. ID No. 1737, Seq. ID No. 1743, Seq. ID No. 1759, Seq. ID No. 1763, Seq. ID No. 1773, Seq. ID No. 1775, Seq. ID No. 1777, Seq. ID No. 1779, Seq. ID No. 1781, Seq. ID No. 1799, Seq. ID No. 1801, Seq. ID No. 1803, Seq. ID No. 1807, Seq. ID No. 1823, Seq. ID No. 1831, Seq. ID No. 1851, Seq. ID No. 1857, Seq. ID No. 1875, Seq. ID No. 1899, Seq. ID No. 1915, Seq. ID No. 1927, Seq. ID No. 1929, Seq. ID No. 1973, Seq. ID No. 1977, Seq. ID No. 1981, Seq. ID No. 2005, Seq. ID No. 2007, Seq. ID No. 2009, Seq. ID No. 2011, Seq. ID No. 2017, Seq. ID No. 2019, Seq. ID No. 2023, Seq. ID No. 2025, Seq. ID No. 2027, Seq. ID No. 2039, Seq. ID No. 2041, Seq. ID No. 2043, Seq. ID No. 2045, Seq. ID No. 2049, Seq. ID No. 2081, Seq. ID No. 2083, Seq. ID No. 2085, Seq. ID No. 2105, Seq. ID No. 2107, Seq. ID No. 2109, Seq. ID No. 2111, Seq. ID No. 2129, Seq. ID No. 2131, Seq. ID No. 2133, Seq. ID No. 2145, Seq. ID No. 2155, Seq. ID No. 2157, Seq. ID No. 2159, Seq. ID No. 2161, Seq. ID No. 2171, Seq. ID No. 2187, Seq. ID No. 2189, Seq. ID No. 2201, Seq. ID No. 2203, Seq. ID No. 2209, Seq. ID No. 2211, Seq. ID No. 2219, Seq. ID No. 2225, Seq. ID No. 2243, Seq. ID No. 2245, Seq. ID No. 2247, Seq. ID No. 2249, Seq. ID No. 2251, Seq. ID No. 2255, Seq. ID No. 2277, Seq. ID No. 2279, Seq. ID No. 2341, Seq. ID No. 2351, Seq. ID No. 2353, Seq. ID No. 2355, Seq. ID No. 2357, Seq. ID No. 2359, Seq. ID No. 2365, Seq. ID No. 2367, Seq. ID No. 2371, Seq. ID No. 2375, Seq. ID No. 2393, Seq. ID No. 2395, Seq. ID No. 2425, Seq. ID No. 2427, Seq. ID No. 2431, Seq. ID No. 2439, Seq. ID No. 2441, Seq. ID No. 2443, Seq. ID No. 2447, Seq. ID No. 2459, Seq. ID No. 2479, Seq. ID No. 2493, Seq. ID No. 2501, Seq. ID No. 2503, Seq. ID No. 2521, Seq. ID No. 2523, Seq. ID No. 2527, Seq. ID No. 2591, Seq. ID No. 2601, Seq. ID No. 2603, Seq. ID No. 2611, Seq. ID No. 2627, Seq. ID No. 2629, Seq. ID No. 2653, Seq. ID No. 2661, Seq. ID No. 2691, Seq. ID No. 2695, Seq. ID No. 2697, Seq. ID No. 2717, Seq. ID No. 2729, Seq. ID No. 2731, Seq. ID No. 2733, Seq. ID No. 2735, Seq. ID No. 2739, Seq. ID No. 2741, Seq. ID No. 2743, Seq. ID No. 2777, Seq. ID No. 2779, Seq. ID No. 2781, Seq. ID No. 2783, Seq. ID No. 2801, Seq. ID No. 2805, Seq. ID No. 2807, Seq. ID No. 2809, Seq. ID

No. 2811, Seq. ID No. 2813, Seq. ID No. 2815, Seq. ID No. 2817, Seq. ID No. 2819,  
Seq. ID No. 2829, Seq. ID No. 2831, Seq. ID No. 2833, Seq. ID No. 2835, Seq. ID No.  
2837, Seq. ID No. 2839, Seq. ID No. 2841, Seq. ID No. 2845, Seq. ID No. 2849, Seq. ID  
No. 2851, Seq. ID No. 2853, Seq. ID No. 2855, Seq. ID No. 2857, Seq. ID No. 2859,  
5 Seq. ID No. 2861, Seq. ID No. 2865, Seq. ID No. 2873, Seq. ID No. 2875, Seq. ID No.  
2877, Seq. ID No. 2883, Seq. ID No. 2885, Seq. ID No. 2887, Seq. ID No. 2889, Seq. ID  
No. 2893, Seq. ID No. 2895, Seq. ID No. 2903, Seq. ID No. 2909, Seq. ID No. 2935,  
Seq. ID No. 2937, Seq. ID No. 2939, Seq. ID No. 2941, Seq. ID No. 2943, Seq. ID No.  
2945, Seq. ID No. 2947, Seq. ID No. 2949, Seq. ID No. 2951, Seq. ID No. 2953, Seq. ID  
10 No. 2965, Seq. ID No. 2967, Seq. ID No. 2973, Seq. ID No. 2975, Seq. ID No. 2977,  
Seq. ID No. 2981, Seq. ID No. 2983, Seq. ID No. 2985, Seq. ID No. 2987, Seq. ID No.  
2989, Seq. ID No. 2991, Seq. ID No. 3001, Seq. ID No. 3007, Seq. ID No. 3009, Seq. ID  
No. 3011, Seq. ID No. 3021, Seq. ID No. 3023, Seq. ID No. 3041, Seq. ID No. 3045,  
Seq. ID No. 3071, Seq. ID No. 3087, Seq. ID No. 3105, Seq. ID No. 3107, Seq. ID No.  
15 3119, Seq. ID No. 3121, Seq. ID No. 3123, Seq. ID No. 3151, Seq. ID No. 3153, Seq. ID  
No. 3167, Seq. ID No. 3173, Seq. ID No. 3175, Seq. ID No. 3177, Seq. ID No. 3181,  
Seq. ID No. 3193, Seq. ID No. 3213, Seq. ID No. 3215, Seq. ID No. 3217, Seq. ID No.  
3219, Seq. ID No. 3221, Seq. ID No. 3223, Seq. ID No. 3231, Seq. ID No. 3233, Seq. ID  
No. 3235, Seq. ID No. 3237, Seq. ID No. 3239, Seq. ID No. 3241, Seq. ID No. 3243,  
20 Seq. ID No. 3245, Seq. ID No. 3247, Seq. ID No. 3249, Seq. ID No. 3261, Seq. ID No.  
3263, Seq. ID No. 3265, Seq. ID No. 3267, Seq. ID No. 3269, Seq. ID No. 3271, Seq. ID  
No. 3273, Seq. ID No. 3275, Seq. ID No. 3277, Seq. ID No. 3325, Seq. ID No. 3331,  
Seq. ID No. 3339, Seq. ID No. 3341, Seq. ID No. 3349, Seq. ID No. 3361, Seq. ID No.  
3363, Seq. ID No. 3369, Seq. ID No. 3371, Seq. ID No. 3389, Seq. ID No. 3403, Seq. ID  
25 No. 3417, Seq. ID No. 3419, Seq. ID No. 3421, Seq. ID No. 3433, Seq. ID No. 3437,  
Seq. ID No. 3441, Seq. ID No. 3443, Seq. ID No. 3445, Seq. ID No. 3447, Seq. ID No.  
3473, Seq. ID No. 3481, Seq. ID No. 3483, Seq. ID No. 3489, Seq. ID No. 3503, Seq. ID  
No. 3505, Seq. ID No. 3509, Seq. ID No. 3511, Seq. ID No. 3523, Seq. ID No. 3525,  
Seq. ID No. 3531, Seq. ID No. 3533, Seq. ID No. 3539, Seq. ID No. 3541, Seq. ID No.  
30 3543, Seq. ID No. 3545, Seq. ID No. 3547, Seq. ID No. 3555, Seq. ID No. 3557, Seq. ID  
No. 3563, Seq. ID No. 3565, Seq. ID No. 3571, Seq. ID No. 3573, Seq. ID No. 3581,  
Seq. ID No. 3587, Seq. ID No. 3591, Seq. ID No. 3593, Seq. ID No. 3595, Seq. ID No.  
3611, Seq. ID No. 3613, Seq. ID No. 3617, Seq. ID No. 3619, Seq. ID No. 3621, Seq. ID

No. 3623, Seq. ID No. 3625, Seq. ID No. 3631, Seq. ID No. 3637, Seq. ID No. 3639,  
Seq. ID No. 3655, Seq. ID No. 3657, Seq. ID No. 3659, Seq. ID No. 3661, Seq. ID No.  
3677, Seq. ID No. 3679, Seq. ID No. 3683, Seq. ID No. 3685, Seq. ID No. 3701, Seq. ID  
No. 3703, Seq. ID No. 3717, Seq. ID No. 3719, Seq. ID No. 3721, Seq. ID No. 3723,  
5 Seq. ID No. 3729, Seq. ID No. 3731, Seq. ID No. 3733, Seq. ID No. 3735, Seq. ID No.  
3737, Seq. ID No. 3739, Seq. ID No. 3741, Seq. ID No. 3749, Seq. ID No. 3751, Seq. ID  
No. 3753, Seq. ID No. 3755, Seq. ID No. 3761, Seq. ID No. 3781, Seq. ID No. 3783,  
Seq. ID No. 3785, Seq. ID No. 3787, Seq. ID No. 3789, Seq. ID No. 3791, Seq. ID No.  
3799, Seq. ID No. 3807, Seq. ID No. 3809, Seq. ID No. 3811, Seq. ID No. 3813, Seq. ID  
10 No. 3815, Seq. ID No. 3817, Seq. ID No. 3827, Seq. ID No. 3829, Seq. ID No. 3831,  
Seq. ID No. 3833, Seq. ID No. 3835, Seq. ID No. 3849, Seq. ID No. 3879, Seq. ID No.  
3881, Seq. ID No. 3895, Seq. ID No. 3903, Seq. ID No. 3909, Seq. ID No. 3915, Seq. ID  
No. 3939, Seq. ID No. 3959, Seq. ID No. 3961, Seq. ID No. 3963, Seq. ID No. 3965,  
Seq. ID No. 3973, Seq. ID No. 3977, Seq. ID No. 3979, Seq. ID No. 3993, Seq. ID No.  
15 3995, Seq. ID No. 3997, Seq. ID No. 4005, Seq. ID No. 4007, Seq. ID No. 4009, Seq. ID  
No. 4041, Seq. ID No. 4043, Seq. ID No. 4045, Seq. ID No. 4069, Seq. ID No. 4077,  
Seq. ID No. 4097, Seq. ID No. 4113, Seq. ID No. 4123, Seq. ID No. 4131, Seq. ID No.  
4133, Seq. ID No. 4135, Seq. ID No. 4139, Seq. ID No. 4151, Seq. ID No. 4153, Seq. ID  
No. 4155, Seq. ID No. 4181, Seq. ID No. 4221, Seq. ID No. 4241, Seq. ID No. 4253,  
20 Seq. ID No. 4257, Seq. ID No. 4259, Seq. ID No. 4261, Seq. ID No. 4263, Seq. ID No.  
4265, Seq. ID No. 4269, Seq. ID No. 4275, Seq. ID No. 4277, Seq. ID No. 4279, Seq. ID  
No. 4281, Seq. ID No. 4285, Seq. ID No. 4287, Seq. ID No. 4297, Seq. ID No. 4305,  
Seq. ID No. 4307, Seq. ID No. 4363, Seq. ID No. 4365, Seq. ID No. 4371, Seq. ID No.  
4373, Seq. ID No. 4395, Seq. ID No. 4399, Seq. ID No. 4403, Seq. ID No. 4425, Seq. ID  
25 No. 4437, Seq. ID No. 4439, Seq. ID No. 4441, Seq. ID No. 4453, Seq. ID No. 4455,  
Seq. ID No. 4513, Seq. ID No. 4515, Seq. ID No. 4551, Seq. ID No. 4561, Seq. ID No.  
4573, Seq. ID No. 4575, Seq. ID No. 4587, Seq. ID No. 4589, Seq. ID No. 4591, Seq. ID  
No. 4593, Seq. ID No. 4595, Seq. ID No. 4617, Seq. ID No. 4619, Seq. ID No. 4621,  
Seq. ID No. 4625, Seq. ID No. 4627, Seq. ID No. 4633, Seq. ID No. 4635, Seq. ID No.  
30 4637, Seq. ID No. 4639, Seq. ID No. 4659, Seq. ID No. 4681, Seq. ID No. 4687, Seq. ID  
No. 4695, Seq. ID No. 4699, Seq. ID No. 4701, Seq. ID No. 4721, Seq. ID No. 4735,  
Seq. ID No. 4737, Seq. ID No. 4741, Seq. ID No. 4783, Seq. ID No. 4789, Seq. ID No.  
4805, Seq. ID No. 4811, Seq. ID No. 4817, Seq. ID No. 4819, Seq. ID No. 4821, Seq. ID

No. 4823, Seq. ID No. 4835, Seq. ID No. 4853, Seq. ID No. 4885, Seq. ID No. 4913,  
Seq. ID No. 4923, Seq. ID No. 4949, Seq. ID No. 4951, Seq. ID No. 4975, Seq. ID No.  
4981, Seq. ID No. 4983, Seq. ID No. 4987, Seq. ID No. 4993, Seq. ID No. 4999, Seq. ID  
No. 5001, Seq. ID No. 5011, Seq. ID No. 5013, Seq. ID No. 5023, Seq. ID No. 5031,  
5 Seq. ID No. 5033, Seq. ID No. 5035, Seq. ID No. 5037, Seq. ID No. 5041, Seq. ID No.  
5043, Seq. ID No. 5053, Seq. ID No. 5061, Seq. ID No. 5063, Seq. ID No. 5085, Seq. ID  
No. 5093, Seq. ID No. 5151, Seq. ID No. 5153, Seq. ID No. 5159, Seq. ID No. 5161,  
Seq. ID No. 5167, Seq. ID No. 5173, Seq. ID No. 5175, Seq. ID No. 5177, Seq. ID No.  
5189, Seq. ID No. 5191, Seq. ID No. 5193, Seq. ID No. 5197, Seq. ID No. 5199, Seq. ID  
10 No. 5221, Seq. ID No. 5223, Seq. ID No. 5225, Seq. ID No. 5227, Seq. ID No. 5237,  
Seq. ID No. 5267, Seq. ID No. 5269, Seq. ID No. 5271, Seq. ID No. 5281, Seq. ID No.  
5301, Seq. ID No. 5303, Seq. ID No. 5315, Seq. ID No. 5321, Seq. ID No. 5327, Seq. ID  
No. 5347, Seq. ID No. 5385, Seq. ID No. 5445, Seq. ID No. 5447, Seq. ID No. 5459,  
Seq. ID No. 5465, Seq. ID No. 5467, Seq. ID No. 5479, Seq. ID No. 5481, Seq. ID No.  
15 5485, Seq. ID No. 5487, Seq. ID No. 5515, Seq. ID No. 5517, Seq. ID No. 5533, Seq. ID  
No. 5543, Seq. ID No. 5545, Seq. ID No. 5549, Seq. ID No. 5569, Seq. ID No. 5577,  
Seq. ID No. 5593, Seq. ID No. 5595, Seq. ID No. 5609, Seq. ID No. 5623, Seq. ID No.  
5625, Seq. ID No. 5639, Seq. ID No. 5641, Seq. ID No. 5643, Seq. ID No. 5649, Seq. ID  
No. 5659, Seq. ID No. 5661, Seq. ID No. 5663, Seq. ID No. 5667, Seq. ID No. 5671,  
20 Seq. ID No. 5687, Seq. ID No. 5689, Seq. ID No. 5703, Seq. ID No. 5705, Seq. ID No.  
5709, Seq. ID No. 5711, Seq. ID No. 5737, Seq. ID No. 5739, Seq. ID No. 5745, Seq. ID  
No. 5751, Seq. ID No. 5763, Seq. ID No. 5797, Seq. ID No. 5811, Seq. ID No. 5813,  
Seq. ID No. 5815, Seq. ID No. 5827, Seq. ID No. 5829, Seq. ID No. 5843, Seq. ID No.  
5845, Seq. ID No. 5873, Seq. ID No. 5879, Seq. ID No. 5883, Seq. ID No. 5885, Seq. ID  
25 No. 5887, Seq. ID No. 5889, Seq. ID No. 5891, Seq. ID No. 5931, Seq. ID No. 5955,  
Seq. ID No. 5963, Seq. ID No. 5965, Seq. ID No. 5975, Seq. ID No. 5983, Seq. ID No.  
5985, Seq. ID No. 5987, Seq. ID No. 5989, Seq. ID No. 6005, Seq. ID No. 6013, Seq. ID  
No. 6031, Seq. ID No. 6035, Seq. ID No. 6045, Seq. ID No. 6059, Seq. ID No. 6061,  
Seq. ID No. 6063, Seq. ID No. 6073, Seq. ID No. 6081, Seq. ID No. 6091, Seq. ID No.  
30 6093, Seq. ID No. 6127, Seq. ID No. 6159, Seq. ID No. 6197, Seq. ID No. 6199, Seq. ID  
No. 6203, Seq. ID No. 6217, Seq. ID No. 6221, Seq. ID No. 6223, Seq. ID No. 6237,  
Seq. ID No. 6239, Seq. ID No. 6241, Seq. ID No. 6245, Seq. ID No. 6247, Seq. ID No.  
6249, Seq. ID No. 6259, Seq. ID No. 6265, Seq. ID No. 6267, Seq. ID No. 6273, Seq. ID

No. 6283, Seq. ID No. 6285, Seq. ID No. 6323, Seq. ID No. 6325, Seq. ID No. 6327, Seq. ID No. 6361, Seq. ID No. 6363, Seq. ID No. 6377, Seq. ID No. 6381, Seq. ID No. 6401, Seq. ID No. 6403, Seq. ID No. 6419, Seq. ID No. 6425, Seq. ID No. 6427, Seq. ID No. 6429, Seq. ID No. 6431, Seq. ID No. 6433, Seq. ID No. 6435, Seq. ID No. 6437, Seq. ID No. 6439, Seq. ID No. 6447, Seq. ID No. 6449, Seq. ID No. 6451, Seq. ID No. 6453, Seq. ID No. 6455, Seq. ID No. 6457, Seq. ID No. 6465, Seq. ID No. 6467, Seq. ID No. 6469, Seq. ID No. 6471, Seq. ID No. 6473, Seq. ID No. 6475, Seq. ID No. 6477, Seq. ID No. 6479, Seq. ID No. 6481, Seq. ID No. 6483, Seq. ID No. 6485, Seq. ID No. 6487, Seq. ID No. 6489, Seq. ID No. 6491, Seq. ID No. 6495, Seq. ID No. 6497, Seq. ID No. 6507, Seq. ID No. 6517, Seq. ID No. 6519, Seq. ID No. 6521, Seq. ID No. 6523, Seq. ID No. 6525, Seq. ID No. 6527, Seq. ID No. 6529, Seq. ID No. 6533, Seq. ID No. 6539, Seq. ID No. 6541, Seq. ID No. 6543, Seq. ID No. 6555, Seq. ID No. 6557, Seq. ID No. 6561, Seq. ID No. 6563, Seq. ID No. 6565, Seq. ID No. 6567, Seq. ID No. 6569, Seq. ID No. 6571, Seq. ID No. 6573, Seq. ID No. 6581, Seq. ID No. 6583, Seq. ID No. 6631, Seq. ID No. 6635, Seq. ID No. 6637, Seq. ID No. 6639, Seq. ID No. 6643, Seq. ID No. 6645, Seq. ID No. 6647, and Seq. ID No. 6649.

In yet another preferred embodiment, the polynucleotide is selected from the *Alloiococcus otitidis* polynucleotides, which encode polypeptides, identified by Glimmer™ ORF finder program, and the polynucleotide is selected from one of Seq. ID No. 1, Seq. ID No. 5, Seq. ID No. 11, Seq. ID No. 13, Seq. ID No. 15, Seq. ID No. 17, Seq. ID No. 25, Seq. ID No. 27, Seq. ID No. 29, Seq. ID No. 35, Seq. ID No. 37, Seq. ID No. 41, Seq. ID No. 43, Seq. ID No. 47, Seq. ID No. 51, Seq. ID No. 53, Seq. ID No. 59, Seq. ID No. 63, Seq. ID No. 69, Seq. ID No. 73, Seq. ID No. 75, Seq. ID No. 81, Seq. ID No. 83, Seq. ID No. 89, Seq. ID No. 93, Seq. ID No. 97, Seq. ID No. 103, Seq. ID No. 111, Seq. ID No. 121, Seq. ID No. 125, Seq. ID No. 129, Seq. ID No. 135, Seq. ID No. 137, Seq. ID No. 145, Seq. ID No. 149, Seq. ID No. 157, Seq. ID No. 167, Seq. ID No. 173, Seq. ID No. 183, Seq. ID No. 187, Seq. ID No. 189, Seq. ID No. 191, Seq. ID No. 195, Seq. ID No. 197, Seq. ID No. 203, Seq. ID No. 207, Seq. ID No. 215, Seq. ID No. 219, Seq. ID No. 223, Seq. ID No. 225, Seq. ID No. 227, Seq. ID No. 231, Seq. ID No. 233, Seq. ID No. 239, Seq. ID No. 241, Seq. ID No. 247, Seq. ID No. 253, Seq. ID No. 261, Seq. ID No. 265, Seq. ID No. 269, Seq. ID No. 273, Seq. ID No. 275, Seq. ID No. 277, Seq. ID No. 283, Seq. ID No. 291, Seq. ID No. 293, Seq. ID No. 297, Seq. ID No. 301, Seq. ID No. 307, Seq. ID No. 309, Seq. ID No. 313, Seq. ID No. 317, Seq. ID No. 321, Seq. ID

No. 325, Seq. ID No. 335, Seq. ID No. 343, Seq. ID No. 345, Seq. ID No. 353, Seq. ID  
No. 355, Seq. ID No. 361, Seq. ID No. 363, Seq. ID No. 367, Seq. ID No. 375, Seq. ID  
No. 379, Seq. ID No. 383, Seq. ID No. 389, Seq. ID No. 391, Seq. ID No. 397, Seq. ID  
No. 405, Seq. ID No. 411, Seq. ID No. 415, Seq. ID No. 417, Seq. ID No. 423, Seq. ID  
5 No. 425, Seq. ID No. 427, Seq. ID No. 429, Seq. ID No. 435, Seq. ID No. 437, Seq. ID  
No. 439, Seq. ID No. 441, Seq. ID No. 445, Seq. ID No. 447, Seq. ID No. 453, Seq. ID  
No. 461, Seq. ID No. 463, Seq. ID No. 471, Seq. ID No. 485, Seq. ID No. 501, Seq. ID  
No. 505, Seq. ID No. 511, Seq. ID No. 515, Seq. ID No. 517, Seq. ID No. 521, Seq. ID  
No. 523, Seq. ID No. 531, Seq. ID No. 533, Seq. ID No. 539, Seq. ID No. 541, Seq. ID  
10 No. 543, Seq. ID No. 551, Seq. ID No. 555, Seq. ID No. 561, Seq. ID No. 565, Seq. ID  
No. 569, Seq. ID No. 575, Seq. ID No. 579, Seq. ID No. 587, Seq. ID No. 593, Seq. ID  
No. 597, Seq. ID No. 603, Seq. ID No. 605, Seq. ID No. 609, Seq. ID No. 611, Seq. ID  
No. 613, Seq. ID No. 615, Seq. ID No. 623, Seq. ID No. 627, Seq. ID No. 629, Seq. ID  
No. 631, Seq. ID No. 635, Seq. ID No. 637, Seq. ID No. 647, Seq. ID No. 649, Seq. ID  
15 No. 661, Seq. ID No. 669, Seq. ID No. 673, Seq. ID No. 675, Seq. ID No. 681, Seq. ID  
No. 683, Seq. ID No. 689, Seq. ID No. 701, Seq. ID No. 703, Seq. ID No. 709, Seq. ID  
No. 713, Seq. ID No. 729, Seq. ID No. 733, Seq. ID No. 735, Seq. ID No. 737, Seq. ID  
No. 741, Seq. ID No. 747, Seq. ID No. 751, Seq. ID No. 753, Seq. ID No. 759, Seq. ID  
No. 765, Seq. ID No. 767, Seq. ID No. 771, Seq. ID No. 781, Seq. ID No. 783, Seq. ID  
20 No. 787, Seq. ID No. 791, Seq. ID No. 795, Seq. ID No. 799, Seq. ID No. 807, Seq. ID  
No. 817, Seq. ID No. 819, Seq. ID No. 823, Seq. ID No. 827, Seq. ID No. 831, Seq. ID  
No. 835, Seq. ID No. 837, Seq. ID No. 839, Seq. ID No. 847, Seq. ID No. 851, Seq. ID  
No. 855, Seq. ID No. 859, Seq. ID No. 867, Seq. ID No. 871, Seq. ID No. 875, Seq. ID  
No. 881, Seq. ID No. 885, Seq. ID No. 889, Seq. ID No. 891, Seq. ID No. 895, Seq. ID  
25 No. 901, Seq. ID No. 907, Seq. ID No. 915, Seq. ID No. 919, Seq. ID No. 925, Seq. ID  
No. 929, Seq. ID No. 935, Seq. ID No. 939, Seq. ID No. 949, Seq. ID No. 951, Seq. ID  
No. 955, Seq. ID No. 961, Seq. ID No. 965, Seq. ID No. 967, Seq. ID No. 971, Seq. ID  
No. 985, Seq. ID No. 993, Seq. ID No. 997, Seq. ID No. 1003, Seq. ID No. 1005, Seq. ID  
No. 1009, Seq. ID No. 1017, Seq. ID No. 1023, Seq. ID No. 1039, Seq. ID No. 1041,  
30 Seq. ID No. 1043, Seq. ID No. 1051, Seq. ID No. 1053, Seq. ID No. 1057, Seq. ID No.  
1061, Seq. ID No. 1065, Seq. ID No. 1067, Seq. ID No. 1069, Seq. ID No. 1073, Seq. ID  
No. 1075, Seq. ID No. 1083, Seq. ID No. 1087, Seq. ID No. 1091, Seq. ID No. 1093,  
Seq. ID No. 1097, Seq. ID No. 1099, Seq. ID No. 1103, Seq. ID No. 1109, Seq. ID No.

1115, Seq. ID No. 1117, Seq. ID No. 1123, Seq. ID No. 1129, Seq. ID No. 1133, Seq. ID  
No. 1137, Seq. ID No. 1143, Seq. ID No. 1147, Seq. ID No. 1149, Seq. ID No. 1155,  
Seq. ID No. 1157, Seq. ID No. 1159, Seq. ID No. 1163, Seq. ID No. 1171, Seq. ID No.  
1179, Seq. ID No. 1181, Seq. ID No. 1187, Seq. ID No. 1193, Seq. ID No. 1199, Seq. ID  
5 No. 1205, Seq. ID No. 1211, Seq. ID No. 1217, Seq. ID No. 1221, Seq. ID No. 1223,  
Seq. ID No. 1225, Seq. ID No. 1231, Seq. ID No. 1233, Seq. ID No. 1237, Seq. ID No.  
1241, Seq. ID No. 1253, Seq. ID No. 1257, Seq. ID No. 1263, Seq. ID No. 1271, Seq. ID  
No. 1281, Seq. ID No. 1317, Seq. ID No. 1323, Seq. ID No. 1331, Seq. ID No. 1335,  
Seq. ID No. 1339, Seq. ID No. 1345, Seq. ID No. 1347, Seq. ID No. 1361, Seq. ID No.  
10 1369, Seq. ID No. 1377, Seq. ID No. 1379, Seq. ID No. 1387, Seq. ID No. 1393, Seq. ID  
No. 1395, Seq. ID No. 1399, Seq. ID No. 1403, Seq. ID No. 1405, Seq. ID No. 1411,  
Seq. ID No. 1413, Seq. ID No. 1415, Seq. ID No. 1419, Seq. ID No. 1425, Seq. ID No.  
1427, Seq. ID No. 1429, Seq. ID No. 1431, Seq. ID No. 1433, Seq. ID No. 1437, Seq. ID  
No. 1443, Seq. ID No. 1449, Seq. ID No. 1451, Seq. ID No. 1455, Seq. ID No. 1457,  
15 Seq. ID No. 1459, Seq. ID No. 1463, Seq. ID No. 1465, Seq. ID No. 1469, Seq. ID No.  
1471, Seq. ID No. 1473, Seq. ID No. 1475, Seq. ID No. 1477, Seq. ID No. 1485, Seq. ID  
No. 1487, Seq. ID No. 1491, Seq. ID No. 1493, Seq. ID No. 1495, Seq. ID No. 1497,  
Seq. ID No. 1501, Seq. ID No. 1505, Seq. ID No. 1507, Seq. ID No. 1509, Seq. ID No.  
1517, Seq. ID No. 1525, Seq. ID No. 1527, Seq. ID No. 1531, Seq. ID No. 1539, Seq. ID  
20 No. 1541, Seq. ID No. 1543, Seq. ID No. 1549, Seq. ID No. 1561, Seq. ID No. 1563,  
Seq. ID No. 1567, Seq. ID No. 1571, Seq. ID No. 1573, Seq. ID No. 1577, Seq. ID No.  
1581, Seq. ID No. 1589, Seq. ID No. 1593, Seq. ID No. 1595, Seq. ID No. 1597, Seq. ID  
No. 1603, Seq. ID No. 1607, Seq. ID No. 1611, Seq. ID No. 1613, Seq. ID No. 1619,  
Seq. ID No. 1623, Seq. ID No. 1627, Seq. ID No. 1631, Seq. ID No. 1637, Seq. ID No.  
25 1639, Seq. ID No. 1641, Seq. ID No. 1647, Seq. ID No. 1653, Seq. ID No. 1657, Seq. ID  
No. 1665, Seq. ID No. 1669, Seq. ID No. 1681, Seq. ID No. 1685, Seq. ID No. 1689,  
Seq. ID No. 1691, Seq. ID No. 1697, Seq. ID No. 1699, Seq. ID No. 1707, Seq. ID No.  
1711, Seq. ID No. 1713, Seq. ID No. 1719, Seq. ID No. 1723, Seq. ID No. 1729, Seq. ID  
No. 1735, Seq. ID No. 1737, Seq. ID No. 1741, Seq. ID No. 1747, Seq. ID No. 1751,  
30 Seq. ID No. 1757, Seq. ID No. 1759, Seq. ID No. 1761, Seq. ID No. 1771, Seq. ID No.  
1777, Seq. ID No. 1785, Seq. ID No. 1789, Seq. ID No. 1791, Seq. ID No. 1797, Seq. ID  
No. 1801, Seq. ID No. 1803, Seq. ID No. 1805, Seq. ID No. 1811, Seq. ID No. 1817,  
Seq. ID No. 1819, Seq. ID No. 1821, Seq. ID No. 1825, Seq. ID No. 1829, Seq. ID No.



1837, Seq. ID No. 1843, Seq. ID No. 1845, Seq. ID No. 1847, Seq. ID No. 1849, Seq. ID  
No. 1851, Seq. ID No. 1855, Seq. ID No. 1859, Seq. ID No. 1863, Seq. ID No. 1865,  
Seq. ID No. 1867, Seq. ID No. 1871, Seq. ID No. 1873, Seq. ID No. 1877, Seq. ID No.  
1885, Seq. ID No. 1887, Seq. ID No. 1889, Seq. ID No. 1895, Seq. ID No. 1897, Seq. ID  
5 No. 1899, Seq. ID No. 1903, Seq. ID No. 1905, Seq. ID No. 1913, Seq. ID No. 1919,  
Seq. ID No. 1923, Seq. ID No. 1925, Seq. ID No. 1931, Seq. ID No. 1935, Seq. ID No.  
1937, Seq. ID No. 1943, Seq. ID No. 1945, Seq. ID No. 1949, Seq. ID No. 1953, Seq. ID  
No. 1957, Seq. ID No. 1959, Seq. ID No. 1961, Seq. ID No. 1965, Seq. ID No. 1967,  
Seq. ID No. 1971, Seq. ID No. 1975, Seq. ID No. 1979, Seq. ID No. 1983, Seq. ID No.  
10 1987, Seq. ID No. 1989, Seq. ID No. 1991, Seq. ID No. 1999, Seq. ID No. 2001, Seq. ID  
No. 2003, Seq. ID No. 2009, Seq. ID No. 2015, Seq. ID No. 2019, Seq. ID No. 2021,  
Seq. ID No. 2031, Seq. ID No. 2035, Seq. ID No. 2037, Seq. ID No. 2045, Seq. ID No.  
2047, Seq. ID No. 2055, Seq. ID No. 2059, Seq. ID No. 2065, Seq. ID No. 2067, Seq. ID  
No. 2069, Seq. ID No. 2071, Seq. ID No. 2073, Seq. ID No. 2079, Seq. ID No. 2091,  
15 Seq. ID No. 2093, Seq. ID No. 2097, Seq. ID No. 2099, Seq. ID No. 2103, Seq. ID No.  
2115, Seq. ID No. 2119, Seq. ID No. 2127, Seq. ID No. 2135, Seq. ID No. 2137, Seq. ID  
No. 2141, Seq. ID No. 2143, Seq. ID No. 2147, Seq. ID No. 2153, Seq. ID No. 2159,  
Seq. ID No. 2161, Seq. ID No. 2165, Seq. ID No. 2169, Seq. ID No. 2179, Seq. ID No.  
2183, Seq. ID No. 2185, Seq. ID No. 2189, Seq. ID No. 2191, Seq. ID No. 2193, Seq. ID  
20 No. 2195, Seq. ID No. 2199, Seq. ID No. 2207, Seq. ID No. 2217, Seq. ID No. 2219,  
Seq. ID No. 2221, Seq. ID No. 2223, Seq. ID No. 2227, Seq. ID No. 2229, Seq. ID No.  
2231, Seq. ID No. 2233, Seq. ID No. 2241, Seq. ID No. 2245, Seq. ID No. 2251, Seq. ID  
No. 2253, Seq. ID No. 2257, Seq. ID No. 2259, Seq. ID No. 2263, Seq. ID No. 2267,  
Seq. ID No. 2269, Seq. ID No. 2275, Seq. ID No. 2281, Seq. ID No. 2287, Seq. ID No.  
25 2297, Seq. ID No. 2299, Seq. ID No. 2301, Seq. ID No. 2315, Seq. ID No. 2329, Seq. ID  
No. 2333, Seq. ID No. 2335, Seq. ID No. 2339, Seq. ID No. 2343, Seq. ID No. 2345,  
Seq. ID No. 2349, Seq. ID No. 2351, Seq. ID No. 2357, Seq. ID No. 2359, Seq. ID No.  
2363, Seq. ID No. 2365, Seq. ID No. 2369, Seq. ID No. 2373, Seq. ID No. 2381, Seq. ID  
No. 2391, Seq. ID No. 2399, Seq. ID No. 2401, Seq. ID No. 2405, Seq. ID No. 2409,  
30 Seq. ID No. 2415, Seq. ID No. 2417, Seq. ID No. 2421, Seq. ID No. 2423, Seq. ID No.  
2427, Seq. ID No. 2429, Seq. ID No. 2431, Seq. ID No. 2435, Seq. ID No. 2437, Seq. ID  
No. 2439, Seq. ID No. 2443, Seq. ID No. 2445, Seq. ID No. 2449, Seq. ID No. 2451,  
Seq. ID No. 2453, Seq. ID No. 2457, Seq. ID No. 2463, Seq. ID No. 2465, Seq. ID No.

2469, Seq. ID No. 2471, Seq. ID No. 2475, Seq. ID No. 2477, Seq. ID No. 2483, Seq. ID  
No. 2485, Seq. ID No. 2491, Seq. ID No. 2495, Seq. ID No. 2505, Seq. ID No. 2507,  
Seq. ID No. 2513, Seq. ID No. 2519, Seq. ID No. 2525, Seq. ID No. 2529, Seq. ID No.  
2535, Seq. ID No. 2537, Seq. ID No. 2539, Seq. ID No. 2549, Seq. ID No. 2553, Seq. ID  
5 No. 2563, Seq. ID No. 2567, Seq. ID No. 2575, Seq. ID No. 2577, Seq. ID No. 2581,  
Seq. ID No. 2589, Seq. ID No. 2593, Seq. ID No. 2595, Seq. ID No. 2599, Seq. ID No.  
2603, Seq. ID No. 2607, Seq. ID No. 2609, Seq. ID No. 2613, Seq. ID No. 2617, Seq. ID  
No. 2619, Seq. ID No. 2623, Seq. ID No. 2625, Seq. ID No. 2631, Seq. ID No. 2633,  
Seq. ID No. 2639, Seq. ID No. 2641, Seq. ID No. 2645, Seq. ID No. 2649, Seq. ID No.  
10 2651, Seq. ID No. 2655, Seq. ID No. 2659, Seq. ID No. 2663, Seq. ID No. 2667, Seq. ID  
No. 2669, Seq. ID No. 2671, Seq. ID No. 2677, Seq. ID No. 2687, Seq. ID No. 2689,  
Seq. ID No. 2693, Seq. ID No. 2699, Seq. ID No. 2703, Seq. ID No. 2709, Seq. ID No.  
2711, Seq. ID No. 2715, Seq. ID No. 2719, Seq. ID No. 2725, Seq. ID No. 2727, Seq. ID  
No. 2737, Seq. ID No. 2743, Seq. ID No. 2747, Seq. ID No. 2751, Seq. ID No. 2753,  
15 Seq. ID No. 2759, Seq. ID No. 2763, Seq. ID No. 2765, Seq. ID No. 2767, Seq. ID No.  
2771, Seq. ID No. 2773, Seq. ID No. 2775, Seq. ID No. 2781, Seq. ID No. 2787, Seq. ID  
No. 2789, Seq. ID No. 2791, Seq. ID No. 2793, Seq. ID No. 2797, Seq. ID No. 2799,  
Seq. ID No. 2803, Seq. ID No. 2805, Seq. ID No. 2811, Seq. ID No. 2815, Seq. ID No.  
2823, Seq. ID No. 2827, Seq. ID No. 2843, Seq. ID No. 2847, Seq. ID No. 2863, Seq. ID  
20 No. 2867, Seq. ID No. 2869, Seq. ID No. 2871, Seq. ID No. 2877, Seq. ID No. 2881,  
Seq. ID No. 2891, Seq. ID No. 2899, Seq. ID No. 2901, Seq. ID No. 2903, Seq. ID No.  
2907, Seq. ID No. 2911, Seq. ID No. 2913, Seq. ID No. 2917, Seq. ID No. 2919, Seq. ID  
No. 2921, Seq. ID No. 2923, Seq. ID No. 2927, Seq. ID No. 2933, Seq. ID No. 2945,  
Seq. ID No. 2953, Seq. ID No. 2957, Seq. ID No. 2963, Seq. ID No. 2971, Seq. ID No.  
25 2973, Seq. ID No. 2977, Seq. ID No. 2979, Seq. ID No. 2983, Seq. ID No. 2985, Seq. ID  
No. 2991, Seq. ID No. 2993, Seq. ID No. 2999, Seq. ID No. 3001, Seq. ID No. 3005,  
Seq. ID No. 3011, Seq. ID No. 3019, Seq. ID No. 3027, Seq. ID No. 3033, Seq. ID No.  
3035, Seq. ID No. 3039, Seq. ID No. 3043, Seq. ID No. 3045, Seq. ID No. 3049, Seq. ID  
No. 3055, Seq. ID No. 3059, Seq. ID No. 3061, Seq. ID No. 3067, Seq. ID No. 3069,  
30 Seq. ID No. 3081, Seq. ID No. 3089, Seq. ID No. 3091, Seq. ID No. 3093, Seq. ID No.  
3097, Seq. ID No. 3103, Seq. ID No. 3107, Seq. ID No. 3111, Seq. ID No. 3117, Seq. ID  
No. 3125, Seq. ID No. 3133, Seq. ID No. 3135, Seq. ID No. 3137, Seq. ID No. 3141,  
Seq. ID No. 3143, Seq. ID No. 3149, Seq. ID No. 3155, Seq. ID No. 3157, Seq. ID No.

3159, Seq. ID No. 3161, Seq. ID No. 3165, Seq. ID No. 3171, Seq. ID No. 3177, Seq. ID  
No. 3179, Seq. ID No. 3183, Seq. ID No. 3185, Seq. ID No. 3189, Seq. ID No. 3191,  
Seq. ID No. 3197, Seq. ID No. 3203, Seq. ID No. 3205, Seq. ID No. 3211, Seq. ID No.  
3217, Seq. ID No. 3221, Seq. ID No. 3227, Seq. ID No. 3229, Seq. ID No. 3233, Seq. ID  
5 No. 3235, Seq. ID No. 3239, Seq. ID No. 3249, Seq. ID No. 3251, Seq. ID No. 3253,  
Seq. ID No. 3257, Seq. ID No. 3259, Seq. ID No. 3263, Seq. ID No. 3265, Seq. ID No.  
3271, Seq. ID No. 3273, Seq. ID No. 3277, Seq. ID No. 3283, Seq. ID No. 3285, Seq. ID  
No. 3287, Seq. ID No. 3289, Seq. ID No. 3293, Seq. ID No. 3295, Seq. ID No. 3299,  
Seq. ID No. 3303, Seq. ID No. 3307, Seq. ID No. 3313, Seq. ID No. 3315, Seq. ID No.  
10 3319, Seq. ID No. 3323, Seq. ID No. 3329, Seq. ID No. 3335, Seq. ID No. 3337, Seq. ID  
No. 3347, Seq. ID No. 3355, Seq. ID No. 3359, Seq. ID No. 3363, Seq. ID No. 3367,  
Seq. ID No. 3377, Seq. ID No. 3379, Seq. ID No. 3383, Seq. ID No. 3387, Seq. ID No.  
3399, Seq. ID No. 3401, Seq. ID No. 3403, Seq. ID No. 3409, Seq. ID No. 3413, Seq. ID  
No. 3415, Seq. ID No. 3417, Seq. ID No. 3425, Seq. ID No. 3427, Seq. ID No. 3431,  
15 Seq. ID No. 3435, Seq. ID No. 3437, Seq. ID No. 3439, Seq. ID No. 3447, Seq. ID No.  
3459, Seq. ID No. 3461, Seq. ID No. 3467, Seq. ID No. 3469, Seq. ID No. 3471, Seq. ID  
No. 3473, Seq. ID No. 3475, Seq. ID No. 3479, Seq. ID No. 3483, Seq. ID No. 3485,  
Seq. ID No. 3487, Seq. ID No. 3495, Seq. ID No. 3501, Seq. ID No. 3505, Seq. ID No.  
3507, Seq. ID No. 3509, Seq. ID No. 3511, Seq. ID No. 3519, Seq. ID No. 3521, Seq. ID  
20 No. 3525, Seq. ID No. 3529, Seq. ID No. 3533, Seq. ID No. 3537, Seq. ID No. 3543,  
Seq. ID No. 3549, Seq. ID No. 3553, Seq. ID No. 3561, Seq. ID No. 3565, Seq. ID No.  
3569, Seq. ID No. 3575, Seq. ID No. 3579, Seq. ID No. 3583, Seq. ID No. 3585, Seq. ID  
No. 3589, Seq. ID No. 3599, Seq. ID No. 3605, Seq. ID No. 3607, Seq. ID No. 3609,  
Seq. ID No. 3611, Seq. ID No. 3615, Seq. ID No. 3619, Seq. ID No. 3629, Seq. ID No.  
25 3635, Seq. ID No. 3639, Seq. ID No. 3641, Seq. ID No. 3643, Seq. ID No. 3645, Seq. ID  
No. 3651, Seq. ID No. 3653, Seq. ID No. 3659, Seq. ID No. 3663, Seq. ID No. 3665,  
Seq. ID No. 3667, Seq. ID No. 3669, Seq. ID No. 3675, Seq. ID No. 3681, Seq. ID No.  
3689, Seq. ID No. 3695, Seq. ID No. 3699, Seq. ID No. 3709, Seq. ID No. 3715, Seq. ID  
No. 3721, Seq. ID No. 3727, Seq. ID No. 3729, Seq. ID No. 3733, Seq. ID No. 3735,  
30 Seq. ID No. 3739, Seq. ID No. 3741, Seq. ID No. 3747, Seq. ID No. 3751, Seq. ID No.  
3759, Seq. ID No. 3771, Seq. ID No. 3775, Seq. ID No. 3779, Seq. ID No. 3783, Seq. ID  
No. 3791, Seq. ID No. 3797, Seq. ID No. 3803, Seq. ID No. 3805, Seq. ID No. 3811,  
Seq. ID No. 3813, Seq. ID No. 3819, Seq. ID No. 3823, Seq. ID No. 3825, Seq. ID No.

3833, Seq. ID No. 3835, Seq. ID No. 3843, Seq. ID No. 3847, Seq. ID No. 3855, Seq. ID  
No. 3857, Seq. ID No. 3863, Seq. ID No. 3867, Seq. ID No. 3873, Seq. ID No. 3877,  
Seq. ID No. 3881, Seq. ID No. 3883, Seq. ID No. 3885, Seq. ID No. 3893, Seq. ID No.  
3897, Seq. ID No. 3901, Seq. ID No. 3907, Seq. ID No. 3913, Seq. ID No. 3915, Seq. ID  
5 No. 3917, Seq. ID No. 3919, Seq. ID No. 3925, Seq. ID No. 3929, Seq. ID No. 3933,  
Seq. ID No. 3935, Seq. ID No. 3937, Seq. ID No. 3941, Seq. ID No. 3943, Seq. ID No.  
3945, Seq. ID No. 3949, Seq. ID No. 3951, Seq. ID No. 3955, Seq. ID No. 3957, Seq. ID  
No. 3971, Seq. ID No. 3975, Seq. ID No. 3983, Seq. ID No. 3985, Seq. ID No. 3987,  
Seq. ID No. 3991, Seq. ID No. 4003, Seq. ID No. 4009, Seq. ID No. 4013, Seq. ID No.  
10 4015, Seq. ID No. 4017, Seq. ID No. 4021, Seq. ID No. 4023, Seq. ID No. 4029, Seq. ID  
No. 4031, Seq. ID No. 4035, Seq. ID No. 4037, Seq. ID No. 4039, Seq. ID No. 4049,  
Seq. ID No. 4055, Seq. ID No. 4057, Seq. ID No. 4061, Seq. ID No. 4063, Seq. ID No.  
4067, Seq. ID No. 4069, Seq. ID No. 4075, Seq. ID No. 4077, Seq. ID No. 4079, Seq. ID  
No. 4087, Seq. ID No. 4089, Seq. ID No. 4095, Seq. ID No. 4097, Seq. ID No. 4099,  
15 Seq. ID No. 4105, Seq. ID No. 4111, Seq. ID No. 4117, Seq. ID No. 4121, Seq. ID No.  
4123, Seq. ID No. 4127, Seq. ID No. 4129, Seq. ID No. 4133, Seq. ID No. 4137, Seq. ID  
No. 4145, Seq. ID No. 4149, Seq. ID No. 4157, Seq. ID No. 4161, Seq. ID No. 4163,  
Seq. ID No. 4167, Seq. ID No. 4173, Seq. ID No. 4179, Seq. ID No. 4185, Seq. ID No.  
4191, Seq. ID No. 4193, Seq. ID No. 4195, Seq. ID No. 4197, Seq. ID No. 4199, Seq. ID  
20 No. 4201, Seq. ID No. 4203, Seq. ID No. 4205, Seq. ID No. 4211, Seq. ID No. 4215,  
Seq. ID No. 4217, Seq. ID No. 4219, Seq. ID No. 4235, Seq. ID No. 4237, Seq. ID No.  
4239, Seq. ID No. 4243, Seq. ID No. 4251, Seq. ID No. 4255, Seq. ID No. 4263, Seq. ID  
No. 4267, Seq. ID No. 4271, Seq. ID No. 4273, Seq. ID No. 4279, Seq. ID No. 4281,  
Seq. ID No. 4283, Seq. ID No. 4291, Seq. ID No. 4295, Seq. ID No. 4299, Seq. ID No.  
25 4301, Seq. ID No. 4303, Seq. ID No. 4307, Seq. ID No. 4309, Seq. ID No. 4313, Seq. ID  
No. 4317, Seq. ID No. 4323, Seq. ID No. 4325, Seq. ID No. 4329, Seq. ID No. 4331,  
Seq. ID No. 4333, Seq. ID No. 4339, Seq. ID No. 4343, Seq. ID No. 4347, Seq. ID No.  
4353, Seq. ID No. 4355, Seq. ID No. 4357, Seq. ID No. 4365, Seq. ID No. 4369, Seq. ID  
No. 4373, Seq. ID No. 4375, Seq. ID No. 4377, Seq. ID No. 4379, Seq. ID No. 4381,  
30 Seq. ID No. 4383, Seq. ID No. 4391, Seq. ID No. 4393, Seq. ID No. 4397, Seq. ID No.  
4401, Seq. ID No. 4411, Seq. ID No. 4417, Seq. ID No. 4423, Seq. ID No. 4431, Seq. ID  
No. 4433, Seq. ID No. 4435, Seq. ID No. 4443, Seq. ID No. 4447, Seq. ID No. 4451,  
Seq. ID No. 4459, Seq. ID No. 4461, Seq. ID No. 4467, Seq. ID No. 4471, Seq. ID No.

4475, Seq. ID No. 4479, Seq. ID No. 4481, Seq. ID No. 4487, Seq. ID No. 4491, Seq. ID  
No. 4501, Seq. ID No. 4505, Seq. ID No. 4511, Seq. ID No. 4523, Seq. ID No. 4531,  
Seq. ID No. 4533, Seq. ID No. 4537, Seq. ID No. 4539, Seq. ID No. 4541, Seq. ID No.  
4543, Seq. ID No. 4547, Seq. ID No. 4549, Seq. ID No. 4559, Seq. ID No. 4565, Seq. ID  
5 No. 4567, Seq. ID No. 4571, Seq. ID No. 4575, Seq. ID No. 4577, Seq. ID No. 4581,  
Seq. ID No. 4585, Seq. ID No. 4591, Seq. ID No. 4595, Seq. ID No. 4597, Seq. ID No.  
4603, Seq. ID No. 4607, Seq. ID No. 4609, Seq. ID No. 4611, Seq. ID No. 4615, Seq. ID  
No. 4623, Seq. ID No. 4627, Seq. ID No. 4631, Seq. ID No. 4635, Seq. ID No. 4637,  
Seq. ID No. 4643, Seq. ID No. 4649, Seq. ID No. 4651, Seq. ID No. 4653, Seq. ID No.  
10 4657, Seq. ID No. 4661, Seq. ID No. 4663, Seq. ID No. 4669, Seq. ID No. 4671, Seq. ID  
No. 4673, Seq. ID No. 4679, Seq. ID No. 4685, Seq. ID No. 4693, Seq. ID No. 4697,  
Seq. ID No. 4703, Seq. ID No. 4705, Seq. ID No. 4713, Seq. ID No. 4717, Seq. ID No.  
4719, Seq. ID No. 4725, Seq. ID No. 4729, Seq. ID No. 4731, Seq. ID No. 4733, Seq. ID  
No. 4739, Seq. ID No. 4743, Seq. ID No. 4745, Seq. ID No. 4747, Seq. ID No. 4749,  
15 Seq. ID No. 4751, Seq. ID No. 4757, Seq. ID No. 4765, Seq. ID No. 4769, Seq. ID No.  
4777, Seq. ID No. 4779, Seq. ID No. 4781, Seq. ID No. 4787, Seq. ID No. 4789, Seq. ID  
No. 4791, Seq. ID No. 4797, Seq. ID No. 4803, Seq. ID No. 4807, Seq. ID No. 4809,  
Seq. ID No. 4811, Seq. ID No. 4813, Seq. ID No. 4815, Seq. ID No. 4821, Seq. ID No.  
4823, Seq. ID No. 4825, Seq. ID No. 4827, Seq. ID No. 4833, Seq. ID No. 4835, Seq. ID  
20 No. 4837, Seq. ID No. 4843, Seq. ID No. 4845, Seq. ID No. 4847, Seq. ID No. 4849,  
Seq. ID No. 4859, Seq. ID No. 4861, Seq. ID No. 4865, Seq. ID No. 4867, Seq. ID No.  
4875, Seq. ID No. 4877, Seq. ID No. 4879, Seq. ID No. 4881, Seq. ID No. 4883, Seq. ID  
No. 4885, Seq. ID No. 4887, Seq. ID No. 4893, Seq. ID No. 4899, Seq. ID No. 4901,  
Seq. ID No. 4903, Seq. ID No. 4905, Seq. ID No. 4907, Seq. ID No. 4911, Seq. ID No.  
25 4915, Seq. ID No. 4917, Seq. ID No. 4919, Seq. ID No. 4921, Seq. ID No. 4927, Seq. ID  
No. 4931, Seq. ID No. 4935, Seq. ID No. 4939, Seq. ID No. 4941, Seq. ID No. 4943,  
Seq. ID No. 4945, Seq. ID No. 4947, Seq. ID No. 4953, Seq. ID No. 4957, Seq. ID No.  
4959, Seq. ID No. 4963, Seq. ID No. 4965, Seq. ID No. 4969, Seq. ID No. 4971, Seq. ID  
No. 4973, Seq. ID No. 4979, Seq. ID No. 4985, Seq. ID No. 4989, Seq. ID No. 4991,  
30 Seq. ID No. 4995, Seq. ID No. 4997, Seq. ID No. 5001, Seq. ID No. 5007, Seq. ID No.  
5009, Seq. ID No. 5017, Seq. ID No. 5021, Seq. ID No. 5027, Seq. ID No. 5029, Seq. ID  
No. 5039, Seq. ID No. 5047, Seq. ID No. 5051, Seq. ID No. 5053, Seq. ID No. 5055,  
Seq. ID No. 5059, Seq. ID No. 5061, Seq. ID No. 5069, Seq. ID No. 5077, Seq. ID No.

5079, Seq. ID No. 5081, Seq. ID No. 5083, Seq. ID No. 5087, Seq. ID No. 5091, Seq. ID  
No. 5093, Seq. ID No. 5097, Seq. ID No. 5103, Seq. ID No. 5105, Seq. ID No. 5109,  
Seq. ID No. 5111, Seq. ID No. 5113, Seq. ID No. 5115, Seq. ID No. 5117, Seq. ID No.  
5127, Seq. ID No. 5141, Seq. ID No. 5145, Seq. ID No. 5149, Seq. ID No. 5153, Seq. ID  
5 No. 5157, Seq. ID No. 5165, Seq. ID No. 5169, Seq. ID No. 5171, Seq. ID No. 5177,  
Seq. ID No. 5183, Seq. ID No. 5185, Seq. ID No. 5187, Seq. ID No. 5193, Seq. ID No.  
5195, Seq. ID No. 5201, Seq. ID No. 5203, Seq. ID No. 5205, Seq. ID No. 5209, Seq. ID  
No. 5211, Seq. ID No. 5215, Seq. ID No. 5219, Seq. ID No. 5227, Seq. ID No. 5231,  
Seq. ID No. 5235, Seq. ID No. 5237, Seq. ID No. 5239, Seq. ID No. 5243, Seq. ID No.  
10 5245, Seq. ID No. 5247, Seq. ID No. 5253, Seq. ID No. 5255, Seq. ID No. 5257, Seq. ID  
No. 5261, Seq. ID No. 5263, Seq. ID No. 5271, Seq. ID No. 5275, Seq. ID No. 5283,  
Seq. ID No. 5291, Seq. ID No. 5299, Seq. ID No. 5305, Seq. ID No. 5309, Seq. ID No.  
5311, Seq. ID No. 5313, Seq. ID No. 5319, Seq. ID No. 5323, Seq. ID No. 5325, Seq. ID  
No. 5335, Seq. ID No. 5337, Seq. ID No. 5341, Seq. ID No. 5345, Seq. ID No. 5351,  
15 Seq. ID No. 5355, Seq. ID No. 5363, Seq. ID No. 5365, Seq. ID No. 5367, Seq. ID No.  
5371, Seq. ID No. 5373, Seq. ID No. 5381, Seq. ID No. 5383, Seq. ID No. 5387, Seq. ID  
No. 5389, Seq. ID No. 5391, Seq. ID No. 5393, Seq. ID No. 5395, Seq. ID No. 5397,  
Seq. ID No. 5399, Seq. ID No. 5401, Seq. ID No. 5403, Seq. ID No. 5409, Seq. ID No.  
5411, Seq. ID No. 5415, Seq. ID No. 5417, Seq. ID No. 5419, Seq. ID No. 5421, Seq. ID  
20 No. 5423, Seq. ID No. 5427, Seq. ID No. 5431, Seq. ID No. 5433, Seq. ID No. 5439,  
Seq. ID No. 5441, Seq. ID No. 5443, Seq. ID No. 5447, Seq. ID No. 5449, Seq. ID No.  
5451, Seq. ID No. 5453, Seq. ID No. 5455, Seq. ID No. 5457, Seq. ID No. 5473, Seq. ID  
No. 5477, Seq. ID No. 5483, Seq. ID No. 5487, Seq. ID No. 5491, Seq. ID No. 5495,  
Seq. ID No. 5499, Seq. ID No. 5503, Seq. ID No. 5507, Seq. ID No. 5509, Seq. ID No.  
25 5513, Seq. ID No. 5527, Seq. ID No. 5531, Seq. ID No. 5537, Seq. ID No. 5539, Seq. ID  
No. 5541, Seq. ID No. 5547, Seq. ID No. 5553, Seq. ID No. 5557, Seq. ID No. 5559,  
Seq. ID No. 5563, Seq. ID No. 5567, Seq. ID No. 5571, Seq. ID No. 5575, Seq. ID No.  
5581, Seq. ID No. 5585, Seq. ID No. 5591, Seq. ID No. 5599, Seq. ID No. 5601, Seq. ID  
No. 5605, Seq. ID No. 5615, Seq. ID No. 5621, Seq. ID No. 5629, Seq. ID No. 5631,  
30 Seq. ID No. 5637, Seq. ID No. 5647, Seq. ID No. 5651, Seq. ID No. 5655, Seq. ID No.  
5657, Seq. ID No. 5661, Seq. ID No. 5665, Seq. ID No. 5669, Seq. ID No. 5671, Seq. ID  
No. 5673, Seq. ID No. 5679, Seq. ID No. 5685, Seq. ID No. 5693, Seq. ID No. 5697,  
Seq. ID No. 5699, Seq. ID No. 5701, Seq. ID No. 5707, Seq. ID No. 5715, Seq. ID No.

5717, Seq. ID No. 5723, Seq. ID No. 5727, Seq. ID No. 5735, Seq. ID No. 5739, Seq. ID  
No. 5749, Seq. ID No. 5751, Seq. ID No. 5755, Seq. ID No. 5761, Seq. ID No. 5771,  
Seq. ID No. 5775, Seq. ID No. 5777, Seq. ID No. 5779, Seq. ID No. 5783, Seq. ID No.  
5789, Seq. ID No. 5795, Seq. ID No. 5801, Seq. ID No. 5803, Seq. ID No. 5809, Seq. ID  
5 No. 5815, Seq. ID No. 5819, Seq. ID No. 5825, Seq. ID No. 5833, Seq. ID No. 5835,  
Seq. ID No. 5841, Seq. ID No. 5845, Seq. ID No. 5847, Seq. ID No. 5849, Seq. ID No.  
5851, Seq. ID No. 5853, Seq. ID No. 5855, Seq. ID No. 5859, Seq. ID No. 5865, Seq. ID  
No. 5871, Seq. ID No. 5875, Seq. ID No. 5877, Seq. ID No. 5881, Seq. ID No. 5887,  
Seq. ID No. 5891, Seq. ID No. 5895, Seq. ID No. 5897, Seq. ID No. 5901, Seq. ID No.  
10 5903, Seq. ID No. 5911, Seq. ID No. 5913, Seq. ID No. 5915, Seq. ID No. 5917, Seq. ID  
No. 5919, Seq. ID No. 5929, Seq. ID No. 5931, Seq. ID No. 5933, Seq. ID No. 5937,  
Seq. ID No. 5941, Seq. ID No. 5943, Seq. ID No. 5947, Seq. ID No. 5951, Seq. ID No.  
5953, Seq. ID No. 5955, Seq. ID No. 5957, Seq. ID No. 5961, Seq. ID No. 5969, Seq. ID  
No. 5973, Seq. ID No. 5979, Seq. ID No. 5981, Seq. ID No. 5985, Seq. ID No. 5989,  
15 Seq. ID No. 5993, Seq. ID No. 6001, Seq. ID No. 6003, Seq. ID No. 6011, Seq. ID No.  
6015, Seq. ID No. 6017, Seq. ID No. 6021, Seq. ID No. 6027, Seq. ID No. 6029, Seq. ID  
No. 6033, Seq. ID No. 6035, Seq. ID No. 6041, Seq. ID No. 6043, Seq. ID No. 6053,  
Seq. ID No. 6057, Seq. ID No. 6065, Seq. ID No. 6071, Seq. ID No. 6079, Seq. ID No.  
6085, Seq. ID No. 6089, Seq. ID No. 6095, Seq. ID No. 6097, Seq. ID No. 6101, Seq. ID  
20 No. 6103, Seq. ID No. 6111, Seq. ID No. 6113, Seq. ID No. 6117, Seq. ID No. 6123,  
Seq. ID No. 6125, Seq. ID No. 6129, Seq. ID No. 6131, Seq. ID No. 6133, Seq. ID No.  
6141, Seq. ID No. 6145, Seq. ID No. 6149, Seq. ID No. 6157, Seq. ID No. 6165, Seq. ID  
No. 6169, Seq. ID No. 6171, Seq. ID No. 6175, Seq. ID No. 6177, Seq. ID No. 6181,  
Seq. ID No. 6187, Seq. ID No. 6195, Seq. ID No. 6201, Seq. ID No. 6209, Seq. ID No.  
25 6213, Seq. ID No. 6215, Seq. ID No. 6219, Seq. ID No. 6233, Seq. ID No. 6235, Seq. ID  
No. 6243, Seq. ID No. 6249, Seq. ID No. 6251, Seq. ID No. 6257, Seq. ID No. 6261,  
Seq. ID No. 6263, Seq. ID No. 6271, Seq. ID No. 6275, Seq. ID No. 6277, Seq. ID No.  
6281, Seq. ID No. 6287, Seq. ID No. 6297, Seq. ID No. 6299, Seq. ID No. 6305, Seq. ID  
No. 6311, Seq. ID No. 6315, Seq. ID No. 6321, Seq. ID No. 6323, Seq. ID No. 6327,  
30 Seq. ID No. 6331, Seq. ID No. 6333, Seq. ID No. 6337, Seq. ID No. 6339, Seq. ID No.  
6341, Seq. ID No. 6343, Seq. ID No. 6345, Seq. ID No. 6353, Seq. ID No. 6357, Seq. ID  
No. 6359, Seq. ID No. 6361, Seq. ID No. 6367, Seq. ID No. 6369, Seq. ID No. 6373,  
Seq. ID No. 6375, Seq. ID No. 6377, Seq. ID No. 6379, Seq. ID No. 6389, Seq. ID No.

6395, Seq. ID No. 6399, Seq. ID No. 6403, Seq. ID No. 6407, Seq. ID No. 6411, Seq. ID No. 6413, Seq. ID No. 6417, Seq. ID No. 6423, Seq. ID No. 6433, Seq. ID No. 6437, Seq. ID No. 6439, Seq. ID No. 6445, Seq. ID No. 6449, Seq. ID No. 6451, Seq. ID No. 6457, Seq. ID No. 6459, Seq. ID No. 6461, Seq. ID No. 6463, Seq. ID No. 6477, Seq. ID No. 6481, Seq. ID No. 6483, Seq. ID No. 6487, Seq. ID No. 6489, Seq. ID No. 6491, Seq. ID No. 6493, Seq. ID No. 6495, Seq. ID No. 6503, Seq. ID No. 6505, Seq. ID No. 6511, Seq. ID No. 6515, Seq. ID No. 6519, Seq. ID No. 6523, Seq. ID No. 6525, Seq. ID No. 6529, Seq. ID No. 6531, Seq. ID No. 6533, Seq. ID No. 6537, Seq. ID No. 6545, Seq. ID No. 6551, Seq. ID No. 6553, Seq. ID No. 6559, Seq. ID No. 6563, Seq. ID No. 6567, Seq. ID No. 6577, Seq. ID No. 6579, Seq. ID No. 6583, Seq. ID No. 6585, Seq. ID No. 6587, Seq. ID No. 6589, Seq. ID No. 6603, Seq. ID No. 6605, Seq. ID No. 6609, Seq. ID No. 6613, Seq. ID No. 6615, Seq. ID No. 6617, Seq. ID No. 6621, Seq. ID No. 6623, Seq. ID No. 6627, Seq. ID No. 6629, Seq. ID No. 6633, and Seq. ID No. 6639.

In yet another preferred embodiment, the polynucleotide is selected from the *Alloiococcus otitidis* polynucleotides, which encode polypeptides, identified by GeneMark™ ORF finder program, and the polynucleotide is selected from one of Seq. ID No. 1, Seq. ID No. 3, Seq. ID No. 11, Seq. ID No. 13, Seq. ID No. 15, Seq. ID No. 17, Seq. ID No. 25, Seq. ID No. 27, Seq. ID No. 29, Seq. ID No. 35, Seq. ID No. 37, Seq. ID No. 39, Seq. ID No. 41, Seq. ID No. 43, Seq. ID No. 45, Seq. ID No. 49, Seq. ID No. 53, Seq. ID No. 57, Seq. ID No. 61, Seq. ID No. 69, Seq. ID No. 71, Seq. ID No. 75, Seq. ID No. 81, Seq. ID No. 83, Seq. ID No. 89, Seq. ID No. 95, Seq. ID No. 101, Seq. ID No. 111, Seq. ID No. 119, Seq. ID No. 125, Seq. ID No. 129, Seq. ID No. 135, Seq. ID No. 137, Seq. ID No. 141, Seq. ID No. 147, Seq. ID No. 151, Seq. ID No. 155, Seq. ID No. 167, Seq. ID No. 171, Seq. ID No. 181, Seq. ID No. 185, Seq. ID No. 187, Seq. ID No. 189, Seq. ID No. 191, Seq. ID No. 195, Seq. ID No. 199, Seq. ID No. 207, Seq. ID No. 213, Seq. ID No. 219, Seq. ID No. 221, Seq. ID No. 225, Seq. ID No. 227, Seq. ID No. 229, Seq. ID No. 233, Seq. ID No. 239, Seq. ID No. 241, Seq. ID No. 243, Seq. ID No. 253, Seq. ID No. 261, Seq. ID No. 263, Seq. ID No. 267, Seq. ID No. 273, Seq. ID No. 275, Seq. ID No. 277, Seq. ID No. 279, Seq. ID No. 291, Seq. ID No. 293, Seq. ID No. 295, Seq. ID No. 299, Seq. ID No. 303, Seq. ID No. 309, Seq. ID No. 311, Seq. ID No. 315, Seq. ID No. 319, Seq. ID No. 323, Seq. ID No. 331, Seq. ID No. 341, Seq. ID No. 345, Seq. ID No. 351, Seq. ID No. 355, Seq. ID No. 361, Seq. ID No. 363, Seq. ID No. 365, Seq. ID No. 375, Seq. ID No. 379, Seq. ID No. 381, Seq. ID No. 383, Seq. ID No.



389, Seq. ID No. 391, Seq. ID No. 395, Seq. ID No. 399, Seq. ID No. 405, Seq. ID No.  
409, Seq. ID No. 413, Seq. ID No. 417, Seq. ID No. 421, Seq. ID No. 423, Seq. ID No.  
425, Seq. ID No. 427, Seq. ID No. 429, Seq. ID No. 435, Seq. ID No. 437, Seq. ID No.  
439, Seq. ID No. 441, Seq. ID No. 443, Seq. ID No. 445, Seq. ID No. 447, Seq. ID No.  
5 449, Seq. ID No. 459, Seq. ID No. 465, Seq. ID No. 485, Seq. ID No. 501, Seq. ID No.  
505, Seq. ID No. 511, Seq. ID No. 513, Seq. ID No. 517, Seq. ID No. 519, Seq. ID No.  
523, Seq. ID No. 529, Seq. ID No. 533, Seq. ID No. 535, Seq. ID No. 541, Seq. ID No.  
543, Seq. ID No. 551, Seq. ID No. 553, Seq. ID No. 559, Seq. ID No. 563, Seq. ID No.  
569, Seq. ID No. 575, Seq. ID No. 579, Seq. ID No. 583, Seq. ID No. 591, Seq. ID No.  
10 595, Seq. ID No. 601, Seq. ID No. 605, Seq. ID No. 607, Seq. ID No. 611, Seq. ID No.  
613, Seq. ID No. 615, Seq. ID No. 621, Seq. ID No. 627, Seq. ID No. 629, Seq. ID No.  
633, Seq. ID No. 635, Seq. ID No. 637, Seq. ID No. 643, Seq. ID No. 649, Seq. ID No.  
651, Seq. ID No. 655, Seq. ID No. 657, Seq. ID No. 669, Seq. ID No. 671, Seq. ID No.  
675, Seq. ID No. 681, Seq. ID No. 683, Seq. ID No. 685, Seq. ID No. 693, Seq. ID No.  
15 703, Seq. ID No. 705, Seq. ID No. 711, Seq. ID No. 725, Seq. ID No. 731, Seq. ID No.  
735, Seq. ID No. 737, Seq. ID No. 741, Seq. ID No. 743, Seq. ID No. 749, Seq. ID No.  
753, Seq. ID No. 759, Seq. ID No. 773, Seq. ID No. 781, Seq. ID No. 783, Seq. ID No.  
785, Seq. ID No. 789, Seq. ID No. 793, Seq. ID No. 797, Seq. ID No. 803, Seq. ID No.  
815, Seq. ID No. 819, Seq. ID No. 821, Seq. ID No. 827, Seq. ID No. 831, Seq. ID No.  
20 833, Seq. ID No. 835, Seq. ID No. 837, Seq. ID No. 841, Seq. ID No. 843, Seq. ID No.  
849, Seq. ID No. 851, Seq. ID No. 853, Seq. ID No. 857, Seq. ID No. 865, Seq. ID No.  
869, Seq. ID No. 873, Seq. ID No. 877, Seq. ID No. 883, Seq. ID No. 887, Seq. ID No.  
891, Seq. ID No. 895, Seq. ID No. 901, Seq. ID No. 907, Seq. ID No. 911, Seq. ID No.  
917, Seq. ID No. 921, Seq. ID No. 927, Seq. ID No. 935, Seq. ID No. 939, Seq. ID No.  
25 945, Seq. ID No. 951, Seq. ID No. 953, Seq. ID No. 959, Seq. ID No. 963, Seq. ID No.  
967, Seq. ID No. 969, Seq. ID No. 977, Seq. ID No. 989, Seq. ID No. 995, Seq. ID No.  
999, Seq. ID No. 1005, Seq. ID No. 1007, Seq. ID No. 1015, Seq. ID No. 1021, Seq. ID  
No. 1035, Seq. ID No. 1041, Seq. ID No. 1043, Seq. ID No. 1049, Seq. ID No. 1053,  
Seq. ID No. 1057, Seq. ID No. 1059, Seq. ID No. 1063, Seq. ID No. 1067, Seq. ID No.  
30 1069, Seq. ID No. 1071, Seq. ID No. 1075, Seq. ID No. 1083, Seq. ID No. 1085, Seq. ID  
No. 1089, Seq. ID No. 1093, Seq. ID No. 1097, Seq. ID No. 1099, Seq. ID No. 1101,  
Seq. ID No. 1109, Seq. ID No. 1113, Seq. ID No. 1117, Seq. ID No. 1121, Seq. ID No.  
1129, Seq. ID No. 1133, Seq. ID No. 1137, Seq. ID No. 1141, Seq. ID No. 1145, Seq. ID

No. 1149, Seq. ID No. 1155, Seq. ID No. 1157, Seq. ID No. 1159, Seq. ID No. 1163,  
Seq. ID No. 1171, Seq. ID No. 1173, Seq. ID No. 1175, Seq. ID No. 1181, Seq. ID No.  
1185, Seq. ID No. 1189, Seq. ID No. 1199, Seq. ID No. 1205, Seq. ID No. 1209, Seq. ID  
5 Seq. ID No. 1215, Seq. ID No. 1219, Seq. ID No. 1223, Seq. ID No. 1225, Seq. ID No. 1233,  
Seq. ID No. 1235, Seq. ID No. 1241, Seq. ID No. 1251, Seq. ID No. 1255, Seq. ID No.  
1261, Seq. ID No. 1271, Seq. ID No. 1281, Seq. ID No. 1315, Seq. ID No. 1323, Seq. ID  
No. 1331, Seq. ID No. 1333, Seq. ID No. 1339, Seq. ID No. 1345, Seq. ID No. 1347,  
Seq. ID No. 1355, Seq. ID No. 1357, Seq. ID No. 1369, Seq. ID No. 1373, Seq. ID No.  
1387, Seq. ID No. 1391, Seq. ID No. 1395, Seq. ID No. 1397, Seq. ID No. 1403, Seq. ID  
10 No. 1405, Seq. ID No. 1407, Seq. ID No. 1413, Seq. ID No. 1415, Seq. ID No. 1417,  
Seq. ID No. 1425, Seq. ID No. 1427, Seq. ID No. 1429, Seq. ID No. 1431, Seq. ID No.  
1433, Seq. ID No. 1435, Seq. ID No. 1439, Seq. ID No. 1441, Seq. ID No. 1451, Seq. ID  
No. 1453, Seq. ID No. 1459, Seq. ID No. 1461, Seq. ID No. 1469, Seq. ID No. 1471,  
Seq. ID No. 1473, Seq. ID No. 1475, Seq. ID No. 1477, Seq. ID No. 1483, Seq. ID No.  
15 1487, Seq. ID No. 1489, Seq. ID No. 1493, Seq. ID No. 1495, Seq. ID No. 1497, Seq. ID  
No. 1501, Seq. ID No. 1503, Seq. ID No. 1507, Seq. ID No. 1509, Seq. ID No. 1517,  
Seq. ID No. 1521, Seq. ID No. 1527, Seq. ID No. 1531, Seq. ID No. 1537, Seq. ID No.  
1541, Seq. ID No. 1543, Seq. ID No. 1549, Seq. ID No. 1561, Seq. ID No. 1563, Seq. ID  
No. 1565, Seq. ID No. 1569, Seq. ID No. 1573, Seq. ID No. 1575, Seq. ID No. 1581,  
20 Seq. ID No. 1587, Seq. ID No. 1591, Seq. ID No. 1595, Seq. ID No. 1597, Seq. ID No.  
1605, Seq. ID No. 1609, Seq. ID No. 1613, Seq. ID No. 1619, Seq. ID No. 1623, Seq. ID  
No. 1627, Seq. ID No. 1629, Seq. ID No. 1635, Seq. ID No. 1641, Seq. ID No. 1647,  
Seq. ID No. 1651, Seq. ID No. 1657, Seq. ID No. 1659, Seq. ID No. 1667, Seq. ID No.  
1669, Seq. ID No. 1679, Seq. ID No. 1683, Seq. ID No. 1687, Seq. ID No. 1691, Seq. ID  
25 No. 1697, Seq. ID No. 1699, Seq. ID No. 1701, Seq. ID No. 1707, Seq. ID No. 1709,  
Seq. ID No. 1713, Seq. ID No. 1717, Seq. ID No. 1721, Seq. ID No. 1725, Seq. ID No.  
1735, Seq. ID No. 1737, Seq. ID No. 1739, Seq. ID No. 1743, Seq. ID No. 1745, Seq. ID  
No. 1749, Seq. ID No. 1755, Seq. ID No. 1769, Seq. ID No. 1773, Seq. ID No. 1777,  
Seq. ID No. 1785, Seq. ID No. 1789, Seq. ID No. 1791, Seq. ID No. 1797, Seq. ID No.  
30 1799, Seq. ID No. 1803, Seq. ID No. 1805, Seq. ID No. 1807, Seq. ID No. 1817, Seq. ID  
No. 1819, Seq. ID No. 1821, Seq. ID No. 1825, Seq. ID No. 1827, Seq. ID No. 1831,  
Seq. ID No. 1835, Seq. ID No. 1841, Seq. ID No. 1845, Seq. ID No. 1847, Seq. ID No.  
1849, Seq. ID No. 1851, Seq. ID No. 1855, Seq. ID No. 1859, Seq. ID No. 1861, Seq. ID

No. 1865, Seq. ID No. 1867, Seq. ID No. 1871, Seq. ID No. 1873, Seq. ID No. 1877, Seq. ID No. 1879, Seq. ID No. 1887, Seq. ID No. 1889, Seq. ID No. 1895, Seq. ID No. 1897, Seq. ID No. 1899, Seq. ID No. 1901, Seq. ID No. 1905, Seq. ID No. 1909, Seq. ID No. 1917, Seq. ID No. 1921, Seq. ID No. 1925, Seq. ID No. 1931, Seq. ID No. 1933, Seq. ID No. 1937, Seq. ID No. 1939, Seq. ID No. 1945, Seq. ID No. 1947, Seq. ID No. 1951, Seq. ID No. 1955, Seq. ID No. 1959, Seq. ID No. 1961, Seq. ID No. 1965, Seq. ID No. 1967, Seq. ID No. 1969, Seq. ID No. 1973, Seq. ID No. 1977, Seq. ID No. 1979, Seq. ID No. 1983, Seq. ID No. 1989, Seq. ID No. 1991, Seq. ID No. 1997, Seq. ID No. 2001, Seq. ID No. 2003, Seq. ID No. 2011, Seq. ID No. 2021, Seq. ID No. 2023, Seq. ID No. 2029, Seq. ID No. 2033, Seq. ID No. 2037, Seq. ID No. 2039, Seq. ID No. 2045, Seq. ID No. 2047, Seq. ID No. 2051, Seq. ID No. 2057, Seq. ID No. 2061, Seq. ID No. 2067, Seq. ID No. 2069, Seq. ID No. 2071, Seq. ID No. 2073, Seq. ID No. 2077, Seq. ID No. 2089, Seq. ID No. 2093, Seq. ID No. 2095, Seq. ID No. 2099, Seq. ID No. 2101, Seq. ID No. 2113, Seq. ID No. 2117, Seq. ID No. 2123, Seq. ID No. 2135, Seq. ID No. 2137, Seq. ID No. 2139, Seq. ID No. 2143, Seq. ID No. 2147, Seq. ID No. 2153, Seq. ID No. 2159, Seq. ID No. 2163, Seq. ID No. 2167, Seq. ID No. 2175, Seq. ID No. 2181, Seq. ID No. 2185, Seq. ID No. 2189, Seq. ID No. 2193, Seq. ID No. 2195, Seq. ID No. 2197, Seq. ID No. 2205, Seq. ID No. 2217, Seq. ID No. 2219, Seq. ID No. 2223, Seq. ID No. 2225, Seq. ID No. 2229, Seq. ID No. 2235, Seq. ID No. 2239, Seq. ID No. 2243, Seq. ID No. 2245, Seq. ID No. 2247, Seq. ID No. 2253, Seq. ID No. 2255, Seq. ID No. 2257, Seq. ID No. 2259, Seq. ID No. 2261, Seq. ID No. 2265, Seq. ID No. 2269, Seq. ID No. 2273, Seq. ID No. 2285, Seq. ID No. 2297, Seq. ID No. 2299, Seq. ID No. 2301, Seq. ID No. 2313, Seq. ID No. 2327, Seq. ID No. 2331, Seq. ID No. 2335, Seq. ID No. 2337, Seq. ID No. 2341, Seq. ID No. 2343, Seq. ID No. 2345, Seq. ID No. 2349, Seq. ID No. 2351, Seq. ID No. 2357, Seq. ID No. 2359, Seq. ID No. 2361, Seq. ID No. 2365, Seq. ID No. 2369, Seq. ID No. 2373, Seq. ID No. 2377, Seq. ID No. 2383, Seq. ID No. 2397, Seq. ID No. 2401, Seq. ID No. 2403, Seq. ID No. 2409, Seq. ID No. 2411, Seq. ID No. 2417, Seq. ID No. 2421, Seq. ID No. 2423, Seq. ID No. 2425, Seq. ID No. 2429, Seq. ID No. 2435, Seq. ID No. 2437, Seq. ID No. 2439, Seq. ID No. 2441, Seq. ID No. 2445, Seq. ID No. 2449, Seq. ID No. 2451, Seq. ID No. 2453, Seq. ID No. 2461, Seq. ID No. 2465, Seq. ID No. 2467, Seq. ID No. 2471, Seq. ID No. 2473, Seq. ID No. 2477, Seq. ID No. 2479, Seq. ID No. 2481, Seq. ID No. 2485, Seq. ID No. 2487, Seq. ID No. 2495, Seq. ID No. 2505, Seq. ID No. 2507, Seq. ID No. 2509, Seq. ID No. 2519, Seq. ID

No. 2525, Seq. ID No. 2527, Seq. ID No. 2529, Seq. ID No. 2535, Seq. ID No. 2537, Seq. ID No. 2539, Seq. ID No. 2547, Seq. ID No. 2551, Seq. ID No. 2563, Seq. ID No. 2565, Seq. ID No. 2573, Seq. ID No. 2577, Seq. ID No. 2579, Seq. ID No. 2585, Seq. ID No. 2593, Seq. ID No. 2595, Seq. ID No. 2599, Seq. ID No. 2607, Seq. ID No. 2609, 5 Seq. ID No. 2613, Seq. ID No. 2615, Seq. ID No. 2619, Seq. ID No. 2623, Seq. ID No. 2625, Seq. ID No. 2631, Seq. ID No. 2633, Seq. ID No. 2639, Seq. ID No. 2641, Seq. ID No. 2643, Seq. ID No. 2647, Seq. ID No. 2651, Seq. ID No. 2655, Seq. ID No. 2657, Seq. ID No. 2661, Seq. ID No. 2665, Seq. ID No. 2669, Seq. ID No. 2671, Seq. ID No. 2673, Seq. ID No. 2681, Seq. ID No. 2689, Seq. ID No. 2693, Seq. ID No. 2699, Seq. ID 10 No. 2703, Seq. ID No. 2709, Seq. ID No. 2711, Seq. ID No. 2713, Seq. ID No. 2719, Seq. ID No. 2721, Seq. ID No. 2727, Seq. ID No. 2737, Seq. ID No. 2741, Seq. ID No. 2745, Seq. ID No. 2749, Seq. ID No. 2753, Seq. ID No. 2757, Seq. ID No. 2761, Seq. ID No. 2765, Seq. ID No. 2767, Seq. ID No. 2769, Seq. ID No. 2773, Seq. ID No. 2775, Seq. ID No. 2777, Seq. ID No. 2787, Seq. ID No. 2789, Seq. ID No. 2791, Seq. ID No. 15 2793, Seq. ID No. 2795, Seq. ID No. 2799, Seq. ID No. 2803, Seq. ID No. 2815, Seq. ID No. 2817, Seq. ID No. 2819, Seq. ID No. 2825, Seq. ID No. 2843, Seq. ID No. 2847, Seq. ID No. 2849, Seq. ID No. 2851, Seq. ID No. 2857, Seq. ID No. 2859, Seq. ID No. 2863, Seq. ID No. 2867, Seq. ID No. 2869, Seq. ID No. 2871, Seq. ID No. 2877, Seq. ID No. 2879, Seq. ID No. 2889, Seq. ID No. 2891, Seq. ID No. 2897, Seq. ID No. 2901, 20 Seq. ID No. 2903, Seq. ID No. 2907, Seq. ID No. 2909, Seq. ID No. 2913, Seq. ID No. 2915, Seq. ID No. 2919, Seq. ID No. 2921, Seq. ID No. 2923, Seq. ID No. 2925, Seq. ID No. 2929, Seq. ID No. 2935, Seq. ID No. 2943, Seq. ID No. 2951, Seq. ID No. 2955, Seq. ID No. 2963, Seq. ID No. 2965, Seq. ID No. 2971, Seq. ID No. 2973, Seq. ID No. 2975, Seq. ID No. 2979, Seq. ID No. 2981, Seq. ID No. 2985, Seq. ID No. 2989, Seq. ID 25 No. 2993, Seq. ID No. 2999, Seq. ID No. 3001, Seq. ID No. 3003, Seq. ID No. 3017, Seq. ID No. 3027, Seq. ID No. 3033, Seq. ID No. 3035, Seq. ID No. 3039, Seq. ID No. 3041, Seq. ID No. 3043, Seq. ID No. 3045, Seq. ID No. 3047, Seq. ID No. 3055, Seq. ID No. 3057, Seq. ID No. 3061, Seq. ID No. 3065, Seq. ID No. 3069, Seq. ID No. 3079, Seq. ID No. 3089, Seq. ID No. 3091, Seq. ID No. 3093, Seq. ID No. 3095, Seq. ID No. 30 3103, Seq. ID No. 3105, Seq. ID No. 3109, Seq. ID No. 3113, Seq. ID No. 3125, Seq. ID No. 3127, Seq. ID No. 3135, Seq. ID No. 3137, Seq. ID No. 3141, Seq. ID No. 3143, Seq. ID No. 3147, Seq. ID No. 3155, Seq. ID No. 3157, Seq. ID No. 3159, Seq. ID No. 3161, Seq. ID No. 3165, Seq. ID No. 3169, Seq. ID No. 3175, Seq. ID No. 3179, Seq. ID

No. 3183, Seq. ID No. 3185, Seq. ID No. 3189, Seq. ID No. 3191, Seq. ID No. 3195, Seq. ID No. 3199, Seq. ID No. 3205, Seq. ID No. 3211, Seq. ID No. 3217, Seq. ID No. 3221, Seq. ID No. 3225, Seq. ID No. 3229, Seq. ID No. 3231, Seq. ID No. 3237, Seq. ID No. 3239, Seq. ID No. 3247, Seq. ID No. 3251, Seq. ID No. 3253, Seq. ID No. 3255, 5 Seq. ID No. 3259, Seq. ID No. 3261, Seq. ID No. 3267, Seq. ID No. 3273, Seq. ID No. 3277, Seq. ID No. 3279, Seq. ID No. 3285, Seq. ID No. 3287, Seq. ID No. 3289, Seq. ID No. 3293, Seq. ID No. 3295, Seq. ID No. 3299, Seq. ID No. 3301, Seq. ID No. 3305, Seq. ID No. 3309, Seq. ID No. 3315, Seq. ID No. 3319, Seq. ID No. 3321, Seq. ID No. 3327, Seq. ID No. 3333, Seq. ID No. 3337, Seq. ID No. 3343, Seq. ID No. 3353, Seq. ID 10 No. 3359, Seq. ID No. 3361, Seq. ID No. 3365, Seq. ID No. 3373, Seq. ID No. 3381, Seq. ID No. 3385, Seq. ID No. 3393, Seq. ID No. 3401, Seq. ID No. 3407, Seq. ID No. 3411, Seq. ID No. 3415, Seq. ID No. 3417, Seq. ID No. 3423, Seq. ID No. 3429, Seq. ID No. 3437, Seq. ID No. 3439, Seq. ID No. 3443, Seq. ID No. 3459, Seq. ID No. 3461, Seq. ID No. 3465, Seq. ID No. 3469, Seq. ID No. 3471, Seq. ID No. 3473, Seq. ID No. 15 3475, Seq. ID No. 3477, Seq. ID No. 3483, Seq. ID No. 3487, Seq. ID No. 3495, Seq. ID No. 3497, Seq. ID No. 3505, Seq. ID No. 3507, Seq. ID No. 3509, Seq. ID No. 3511, Seq. ID No. 3515, Seq. ID No. 3521, Seq. ID No. 3523, Seq. ID No. 3529, Seq. ID No. 3535, Seq. ID No. 3541, Seq. ID No. 3551, Seq. ID No. 3559, Seq. ID No. 3563, Seq. ID No. 3567, Seq. ID No. 3575, Seq. ID No. 3577, Seq. ID No. 3583, Seq. ID No. 3585, 20 Seq. ID No. 3589, Seq. ID No. 3591, Seq. ID No. 3599, Seq. ID No. 3601, Seq. ID No. 3607, Seq. ID No. 3609, Seq. ID No. 3611, Seq. ID No. 3615, Seq. ID No. 3619, Seq. ID No. 3629, Seq. ID No. 3631, Seq. ID No. 3633, Seq. ID No. 3637, Seq. ID No. 3641, Seq. ID No. 3643, Seq. ID No. 3645, Seq. ID No. 3651, Seq. ID No. 3653, Seq. ID No. 3655, Seq. ID No. 3661, Seq. ID No. 3665, Seq. ID No. 3667, Seq. ID No. 3669, Seq. ID 25 No. 3675, Seq. ID No. 3681, Seq. ID No. 3689, Seq. ID No. 3695, Seq. ID No. 3697, Seq. ID No. 3705, Seq. ID No. 3711, Seq. ID No. 3719, Seq. ID No. 3725, Seq. ID No. 3729, Seq. ID No. 3731, Seq. ID No. 3735, Seq. ID No. 3739, Seq. ID No. 3741, Seq. ID No. 3743, Seq. ID No. 3749, Seq. ID No. 3759, Seq. ID No. 3769, Seq. ID No. 3773, Seq. ID No. 3777, Seq. ID No. 3781, Seq. ID No. 3787, Seq. ID No. 3795, Seq. ID No. 30 3801, Seq. ID No. 3805, Seq. ID No. 3809, Seq. ID No. 3813, Seq. ID No. 3819, Seq. ID No. 3821, Seq. ID No. 3825, Seq. ID No. 3827, Seq. ID No. 3829, Seq. ID No. 3831, Seq. ID No. 3835, Seq. ID No. 3841, Seq. ID No. 3845, Seq. ID No. 3855, Seq. ID No. 3857, Seq. ID No. 3863, Seq. ID No. 3867, Seq. ID No. 3869, Seq. ID No. 3875, Seq. ID

No. 3881, Seq. ID No. 3883, Seq. ID No. 3885, Seq. ID No. 3887, Seq. ID No. 3897,  
Seq. ID No. 3901, Seq. ID No. 3905, Seq. ID No. 3909, Seq. ID No. 3913, Seq. ID No.  
3915, Seq. ID No. 3917, Seq. ID No. 3919, Seq. ID No. 3921, Seq. ID No. 3929, Seq. ID  
5 Seq. ID No. 3931, Seq. ID No. 3935, Seq. ID No. 3941, Seq. ID No. 3943, Seq. ID No. 3945,  
Seq. ID No. 3947, Seq. ID No. 3951, Seq. ID No. 3953, Seq. ID No. 3957, Seq. ID No.  
3971, Seq. ID No. 3977, Seq. ID No. 3981, Seq. ID No. 3985, Seq. ID No. 3987, Seq. ID  
No. 3989, Seq. ID No. 3993, Seq. ID No. 4001, Seq. ID No. 4005, Seq. ID No. 4011,  
Seq. ID No. 4015, Seq. ID No. 4017, Seq. ID No. 4019, Seq. ID No. 4023, Seq. ID No.  
4029, Seq. ID No. 4031, Seq. ID No. 4033, Seq. ID No. 4037, Seq. ID No. 4039, Seq. ID  
10 No. 4049, Seq. ID No. 4051, Seq. ID No. 4057, Seq. ID No. 4059, Seq. ID No. 4065,  
Seq. ID No. 4069, Seq. ID No. 4075, Seq. ID No. 4079, Seq. ID No. 4085, Seq. ID No.  
4089, Seq. ID No. 4095, Seq. ID No. 4097, Seq. ID No. 4099, Seq. ID No. 4105, Seq. ID  
No. 4111, Seq. ID No. 4115, Seq. ID No. 4121, Seq. ID No. 4123, Seq. ID No. 4127,  
Seq. ID No. 4129, Seq. ID No. 4131, Seq. ID No. 4137, Seq. ID No. 4141, Seq. ID No.  
15 4147, Seq. ID No. 4157, Seq. ID No. 4159, Seq. ID No. 4163, Seq. ID No. 4165, Seq. ID  
No. 4169, Seq. ID No. 4179, Seq. ID No. 4183, Seq. ID No. 4187, Seq. ID No. 4193,  
Seq. ID No. 4195, Seq. ID No. 4197, Seq. ID No. 4199, Seq. ID No. 4201, Seq. ID No.  
4205, Seq. ID No. 4207, Seq. ID No. 4213, Seq. ID No. 4219, Seq. ID No. 4235, Seq. ID  
No. 4237, Seq. ID No. 4239, Seq. ID No. 4243, Seq. ID No. 4245, Seq. ID No. 4255,  
20 Seq. ID No. 4259, Seq. ID No. 4267, Seq. ID No. 4271, Seq. ID No. 4277, Seq. ID No.  
4279, Seq. ID No. 4281, Seq. ID No. 4283, Seq. ID No. 4289, Seq. ID No. 4293, Seq. ID  
No. 4299, Seq. ID No. 4301, Seq. ID No. 4303, Seq. ID No. 4305, Seq. ID No. 4307,  
Seq. ID No. 4309, Seq. ID No. 4313, Seq. ID No. 4315, Seq. ID No. 4323, Seq. ID No.  
4325, Seq. ID No. 4327, Seq. ID No. 4331, Seq. ID No. 4333, Seq. ID No. 4337, Seq. ID  
25 No. 4341, Seq. ID No. 4345, Seq. ID No. 4349, Seq. ID No. 4355, Seq. ID No. 4357,  
Seq. ID No. 4365, Seq. ID No. 4367, Seq. ID No. 4371, Seq. ID No. 4375, Seq. ID No.  
4377, Seq. ID No. 4379, Seq. ID No. 4383, Seq. ID No. 4387, Seq. ID No. 4393, Seq. ID  
No. 4397, Seq. ID No. 4401, Seq. ID No. 4409, Seq. ID No. 4413, Seq. ID No. 4421,  
Seq. ID No. 4433, Seq. ID No. 4435, Seq. ID No. 4445, Seq. ID No. 4449, Seq. ID No.  
30 4457, Seq. ID No. 4461, Seq. ID No. 4463, Seq. ID No. 4471, Seq. ID No. 4475, Seq. ID  
No. 4477, Seq. ID No. 4481, Seq. ID No. 4487, Seq. ID No. 4491, Seq. ID No. 4499,  
Seq. ID No. 4501, Seq. ID No. 4503, Seq. ID No. 4509, Seq. ID No. 4517, Seq. ID No.  
4531, Seq. ID No. 4533, Seq. ID No. 4535, Seq. ID No. 4539, Seq. ID No. 4541, Seq. ID

No. 4545, Seq. ID No. 4549, Seq. ID No. 4557, Seq. ID No. 4563, Seq. ID No. 4567, Seq. ID No. 4569, Seq. ID No. 4575, Seq. ID No. 4577, Seq. ID No. 4579, Seq. ID No. 4583, Seq. ID No. 4591, Seq. ID No. 4593, Seq. ID No. 4597, Seq. ID No. 4601, Seq. ID No. 4605, Seq. ID No. 4609, Seq. ID No. 4611, Seq. ID No. 4613, Seq. ID No. 4623, Seq. ID No. 4625, Seq. ID No. 4629, Seq. ID No. 4633, Seq. ID No. 4637, Seq. ID No. 4641, Seq. ID No. 4645, Seq. ID No. 4651, Seq. ID No. 4653, Seq. ID No. 4655, Seq. ID No. 4661, Seq. ID No. 4663, Seq. ID No. 4669, Seq. ID No. 4671, Seq. ID No. 4673, Seq. ID No. 4675, Seq. ID No. 4685, Seq. ID No. 4689, Seq. ID No. 4697, Seq. ID No. 4703, Seq. ID No. 4705, Seq. ID No. 4713, Seq. ID No. 4717, Seq. ID No. 4719, Seq. ID No. 4723, Seq. ID No. 4729, Seq. ID No. 4731, Seq. ID No. 4733, Seq. ID No. 4739, Seq. ID No. 4743, Seq. ID No. 4745, Seq. ID No. 4747, Seq. ID No. 4749, Seq. ID No. 4751, Seq. ID No. 4753, Seq. ID No. 4761, Seq. ID No. 4767, Seq. ID No. 4771, Seq. ID No. 4779, Seq. ID No. 4781, Seq. ID No. 4783, Seq. ID No. 4785, Seq. ID No. 4789, Seq. ID No. 4791, Seq. ID No. 4793, Seq. ID No. 4799, Seq. ID No. 4807, Seq. ID No. 4809, Seq. ID No. 4811, Seq. ID No. 4813, Seq. ID No. 4815, Seq. ID No. 4821, Seq. ID No. 4825, Seq. ID No. 4827, Seq. ID No. 4829, Seq. ID No. 4837, Seq. ID No. 4839, Seq. ID No. 4845, Seq. ID No. 4847, Seq. ID No. 4849, Seq. ID No. 4857, Seq. ID No. 4861, Seq. ID No. 4865, Seq. ID No. 4867, Seq. ID No. 4875, Seq. ID No. 4879, Seq. ID No. 4881, Seq. ID No. 4883, Seq. ID No. 4885, Seq. ID No. 4887, Seq. ID No. 4893, Seq. ID No. 4899, Seq. ID No. 4901, Seq. ID No. 4903, Seq. ID No. 4905, Seq. ID No. 4907, Seq. ID No. 4909, Seq. ID No. 4915, Seq. ID No. 4917, Seq. ID No. 4919, Seq. ID No. 4921, Seq. ID No. 4925, Seq. ID No. 4929, Seq. ID No. 4933, Seq. ID No. 4937, Seq. ID No. 4941, Seq. ID No. 4943, Seq. ID No. 4945, Seq. ID No. 4947, Seq. ID No. 4953, Seq. ID No. 4955, Seq. ID No. 4959, Seq. ID No. 4961, Seq. ID No. 4965, Seq. ID No. 4967, Seq. ID No. 4971, Seq. ID No. 4973, Seq. ID No. 4977, Seq. ID No. 4985, Seq. ID No. 4989, Seq. ID No. 4991, Seq. ID No. 4995, Seq. ID No. 4997, Seq. ID No. 5005, Seq. ID No. 5009, Seq. ID No. 5015, Seq. ID No. 5019, Seq. ID No. 5025, Seq. ID No. 5029, Seq. ID No. 5037, Seq. ID No. 5045, Seq. ID No. 5049, Seq. ID No. 5053, Seq. ID No. 5055, Seq. ID No. 5059, Seq. ID No. 5061, Seq. ID No. 5065, Seq. ID No. 5071, Seq. ID No. 5073, Seq. ID No. 5079, Seq. ID No. 5081, Seq. ID No. 5083, Seq. ID No. 5087, Seq. ID No. 5089, Seq. ID No. 5093, Seq. ID No. 5095, Seq. ID No. 5103, Seq. ID No. 5105, Seq. ID No. 5107, Seq. ID No. 5111, Seq. ID No. 5113, Seq. ID No. 5115, Seq. ID No. 5117, Seq. ID No. 5119, Seq. ID No. 5141, Seq. ID No. 5143, Seq. ID

No. 5147, Seq. ID No. 5153, Seq. ID No. 5155, Seq. ID No. 5163, Seq. ID No. 5169, Seq. ID No. 5171, Seq. ID No. 5173, Seq. ID No. 5179, Seq. ID No. 5185, Seq. ID No. 5187, Seq. ID No. 5193, Seq. ID No. 5195, Seq. ID No. 5201, Seq. ID No. 5203, Seq. ID No. 5205, Seq. ID No. 5209, Seq. ID No. 5211, Seq. ID No. 5213, Seq. ID No. 5217, 5 Seq. ID No. 5225, Seq. ID No. 5231, Seq. ID No. 5233, Seq. ID No. 5237, Seq. ID No. 5239, Seq. ID No. 5245, Seq. ID No. 5247, Seq. ID No. 5249, Seq. ID No. 5255, Seq. ID No. 5257, Seq. ID No. 5259, Seq. ID No. 5263, Seq. ID No. 5269, Seq. ID No. 5273, Seq. ID No. 5283, Seq. ID No. 5289, Seq. ID No. 5293, Seq. ID No. 5307, Seq. ID No. 5311, Seq. ID No. 5313, Seq. ID No. 5315, Seq. ID No. 5323, Seq. ID No. 5325, Seq. ID 10 No. 5335, Seq. ID No. 5337, Seq. ID No. 5339, Seq. ID No. 5345, Seq. ID No. 5347, Seq. ID No. 5349, Seq. ID No. 5353, Seq. ID No. 5361, Seq. ID No. 5365, Seq. ID No. 5367, Seq. ID No. 5369, Seq. ID No. 5373, Seq. ID No. 5375, Seq. ID No. 5387, Seq. ID No. 5389, Seq. ID No. 5391, Seq. ID No. 5393, Seq. ID No. 5395, Seq. ID No. 5397, Seq. ID No. 5399, Seq. ID No. 5401, Seq. ID No. 5403, Seq. ID No. 5405, Seq. ID No. 15 5411, Seq. ID No. 5415, Seq. ID No. 5417, Seq. ID No. 5419, Seq. ID No. 5421, Seq. ID No. 5423, Seq. ID No. 5429, Seq. ID No. 5433, Seq. ID No. 5441, Seq. ID No. 5443, Seq. ID No. 5445, Seq. ID No. 5449, Seq. ID No. 5451, Seq. ID No. 5453, Seq. ID No. 5455, Seq. ID No. 5457, Seq. ID No. 5469, Seq. ID No. 5475, Seq. ID No. 5483, Seq. ID No. 5485, Seq. ID No. 5489, Seq. ID No. 5493, Seq. ID No. 5499, Seq. ID No. 5501, 20 Seq. ID No. 5505, Seq. ID No. 5509, Seq. ID No. 5511, Seq. ID No. 5523, Seq. ID No. 5529, Seq. ID No. 5535, Seq. ID No. 5539, Seq. ID No. 5541, Seq. ID No. 5547, Seq. ID No. 5551, Seq. ID No. 5555, Seq. ID No. 5559, Seq. ID No. 5561, Seq. ID No. 5565, Seq. ID No. 5571, Seq. ID No. 5573, Seq. ID No. 5579, Seq. ID No. 5583, Seq. ID No. 5589, Seq. ID No. 5599, Seq. ID No. 5601, Seq. ID No. 5603, Seq. ID No. 5613, Seq. ID 25 No. 5621, Seq. ID No. 5627, Seq. ID No. 5631, Seq. ID No. 5635, Seq. ID No. 5645, Seq. ID No. 5651, Seq. ID No. 5653, Seq. ID No. 5657, Seq. ID No. 5661, Seq. ID No. 5663, Seq. ID No. 5665, Seq. ID No. 5669, Seq. ID No. 5671, Seq. ID No. 5673, Seq. ID No. 5675, Seq. ID No. 5681, Seq. ID No. 5693, Seq. ID No. 5695, Seq. ID No. 5699, Seq. ID No. 5701, Seq. ID No. 5707, Seq. ID No. 5713, Seq. ID No. 5717, Seq. ID No. 30 5723, Seq. ID No. 5725, Seq. ID No. 5731, Seq. ID No. 5737, Seq. ID No. 5747, Seq. ID No. 5751, Seq. ID No. 5755, Seq. ID No. 5759, Seq. ID No. 5771, Seq. ID No. 5773, Seq. ID No. 5777, Seq. ID No. 5779, Seq. ID No. 5781, Seq. ID No. 5785, Seq. ID No. 5793, Seq. ID No. 5799, Seq. ID No. 5805, Seq. ID No. 5811, Seq. ID No. 5815, Seq. ID



No. 5817, Seq. ID No. 5823, Seq. ID No. 5831, Seq. ID No. 5835, Seq. ID No. 5839, Seq. ID No. 5843, Seq. ID No. 5847, Seq. ID No. 5849, Seq. ID No. 5851, Seq. ID No. 5853, Seq. ID No. 5855, Seq. ID No. 5857, Seq. ID No. 5861, Seq. ID No. 5867, Seq. ID No. 5875, Seq. ID No. 5877, Seq. ID No. 5881, Seq. ID No. 5889, Seq. ID No. 5895, Seq. ID No. 5897, Seq. ID No. 5901, Seq. ID No. 5903, Seq. ID No. 5907, Seq. ID No. 5913, Seq. ID No. 5915, Seq. ID No. 5917, Seq. ID No. 5919, Seq. ID No. 5925, Seq. ID No. 5931, Seq. ID No. 5933, Seq. ID No. 5935, Seq. ID No. 5941, Seq. ID No. 5943, Seq. ID No. 5945, Seq. ID No. 5949, Seq. ID No. 5955, Seq. ID No. 5957, Seq. ID No. 5959, Seq. ID No. 5967, Seq. ID No. 5971, Seq. ID No. 5975, Seq. ID No. 5977, Seq. ID No. 5981, Seq. ID No. 5983, Seq. ID No. 5985, Seq. ID No. 5989, Seq. ID No. 5991, Seq. ID No. 5995, Seq. ID No. 5997, Seq. ID No. 6003, Seq. ID No. 6005, Seq. ID No. 6007, Seq. ID No. 6015, Seq. ID No. 6017, Seq. ID No. 6019, Seq. ID No. 6023, Seq. ID No. 6029, Seq. ID No. 6033, Seq. ID No. 6035, Seq. ID No. 6037, Seq. ID No. 6043, Seq. ID No. 6049, Seq. ID No. 6055, Seq. ID No. 6065, Seq. ID No. 6069, Seq. ID No. 6075, Seq. ID No. 6081, Seq. ID No. 6083, Seq. ID No. 6087, Seq. ID No. 6095, Seq. ID No. 6097, Seq. ID No. 6099, Seq. ID No. 6103, Seq. ID No. 6105, Seq. ID No. 6113, Seq. ID No. 6115, Seq. ID No. 6119, Seq. ID No. 6125, Seq. ID No. 6127, Seq. ID No. 6129, Seq. ID No. 6131, Seq. ID No. 6133, Seq. ID No. 6141, Seq. ID No. 6143, Seq. ID No. 6147, Seq. ID No. 6153, Seq. ID No. 6165, Seq. ID No. 6169, Seq. ID No. 6171, Seq. ID No. 6173, Seq. ID No. 6177, Seq. ID No. 6179, Seq. ID No. 6187, Seq. ID No. 6193, Seq. ID No. 6201, Seq. ID No. 6207, Seq. ID No. 6211, Seq. ID No. 6215, Seq. ID No. 6219, Seq. ID No. 6231, Seq. ID No. 6235, Seq. ID No. 6243, Seq. ID No. 6247, Seq. ID No. 6251, Seq. ID No. 6255, Seq. ID No. 6261, Seq. ID No. 6263, Seq. ID No. 6269, Seq. ID No. 6275, Seq. ID No. 6277, Seq. ID No. 6279, Seq. ID No. 6287, Seq. ID No. 6291, Seq. ID No. 6299, Seq. ID No. 6305, Seq. ID No. 6307, Seq. ID No. 6313, Seq. ID No. 6315, Seq. ID No. 6321, Seq. ID No. 6323, Seq. ID No. 6325, Seq. ID No. 6331, Seq. ID No. 6335, Seq. ID No. 6339, Seq. ID No. 6341, Seq. ID No. 6343, Seq. ID No. 6345, Seq. ID No. 6347, Seq. ID No. 6355, Seq. ID No. 6359, Seq. ID No. 6361, Seq. ID No. 6365, Seq. ID No. 6369, Seq. ID No. 6371, Seq. ID No. 6375, Seq. ID No. 6377, Seq. ID No. 6379, Seq. ID No. 6387, Seq. ID No. 6391, Seq. ID No. 6397, Seq. ID No. 6401, Seq. ID No. 6405, Seq. ID No. 6409, Seq. ID No. 6413, Seq. ID No. 6417, Seq. ID No. 6419, Seq. ID No. 6423, Seq. ID No. 6429, Seq. ID No. 6433, Seq. ID No. 6435, Seq. ID No. 6439, Seq. ID No. 6445, Seq. ID No. 6447, Seq. ID No. 6451, Seq. ID

No. 6455, Seq. ID No. 6459, Seq. ID No. 6461, Seq. ID No. 6463, Seq. ID No. 6475, Seq. ID No. 6481, Seq. ID No. 6483, Seq. ID No. 6485, Seq. ID No. 6487, Seq. ID No. 6489, Seq. ID No. 6491, Seq. ID No. 6493, Seq. ID No. 6495, Seq. ID No. 6499, Seq. ID No. 6505, Seq. ID No. 6509, Seq. ID No. 6513, Seq. ID No. 6519, Seq. ID No. 6521, Seq. ID No. 6525, Seq. ID No. 6527, Seq. ID No. 6531, Seq. ID No. 6533, Seq. ID No. 6535, Seq. ID No. 6545, Seq. ID No. 6551, Seq. ID No. 6553, Seq. ID No. 6559, Seq. ID No. 6561, Seq. ID No. 6563, Seq. ID No. 6565, Seq. ID No. 6567, Seq. ID No. 6569, Seq. ID No. 6575, Seq. ID No. 6579, Seq. ID No. 6583, Seq. ID No. 6585, Seq. ID No. 6591, Seq. ID No. 6595, Seq. ID No. 6605, Seq. ID No. 6607, Seq. ID No. 6611, Seq. ID No. 6615, Seq. ID No. 6617, Seq. ID No. 6619, Seq. ID No. 6623, Seq. ID No. 6625, Seq. ID No. 6629, Seq. ID No. 6633, Seq. ID No. 6635, Seq. ID No. 6641, and Seq. ID No. 6647.

In another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a polypeptide, which has been identified by the Applicants' assignee's ORF finder program that searches for an ATG, GTG or TTG Start codon between "Stop-Stop" region, and the polynucleotide is selected from one of Seq. ID No. 1, Seq. ID No. 5, Seq. ID No. 11, Seq. ID No. 13, Seq. ID No. 15, Seq. ID No. 17, Seq. ID No. 19, Seq. ID No. 21, Seq. ID No. 23, Seq. ID No. 27, Seq. ID No. 29, Seq. ID No. 31, Seq. ID No. 35, Seq. ID No. 37, Seq. ID No. 41, Seq. ID No. 43, Seq. ID No. 45, Seq. ID No. 47, Seq. ID No. 49, Seq. ID No. 51, Seq. ID No. 53, Seq. ID No. 55, Seq. ID No. 57, Seq. ID No. 59, Seq. ID No. 65, Seq. ID No. 67, Seq. ID No. 75, Seq. ID No. 77, Seq. ID No. 79, Seq. ID No. 81, Seq. ID No. 83, Seq. ID No. 89, Seq. ID No. 91, Seq. ID No. 93, Seq. ID No. 97, Seq. ID No. 99, Seq. ID No. 103, Seq. ID No. 105, Seq. ID No. 107, Seq. ID No. 109, Seq. ID No. 111, Seq. ID No. 113, Seq. ID No. 115, Seq. ID No. 117, Seq. ID No. 119, Seq. ID No. 121, Seq. ID No. 127, Seq. ID No. 129, Seq. ID No. 131, Seq. ID No. 133, Seq. ID No. 135, Seq. ID No. 137, Seq. ID No. 139, Seq. ID No. 143, Seq. ID No. 145, Seq. ID No. 147, Seq. ID No. 149, Seq. ID No. 153, Seq. ID No. 155, Seq. ID No. 157, Seq. ID No. 159, Seq. ID No. 161, Seq. ID No. 163, Seq. ID No. 165, Seq. ID No. 167, Seq. ID No. 169, Seq. ID No. 171, Seq. ID No. 175, Seq. ID No. 177, Seq. ID No. 179, Seq. ID No. 181, Seq. ID No. 183, Seq. ID No. 187, Seq. ID No. 191, Seq. ID No. 193, Seq. ID No. 195, Seq. ID No. 201, Seq. ID No. 205, Seq. ID No. 207, Seq. ID No. 215, Seq. ID No. 219, Seq. ID No. 221, Seq. ID No. 223, Seq. ID No. 225, Seq. ID No. 227, Seq. ID No. 231, Seq. ID

No. 233, Seq. ID No. 239, Seq. ID No. 243, Seq. ID No. 245, Seq. ID No. 247, Seq. ID  
No. 253, Seq. ID No. 257, Seq. ID No. 259, Seq. ID No. 261, Seq. ID No. 263, Seq. ID  
No. 265, Seq. ID No. 267, Seq. ID No. 269, Seq. ID No. 273, Seq. ID No. 277, Seq. ID  
No. 279, Seq. ID No. 281, Seq. ID No. 283, Seq. ID No. 291, Seq. ID No. 293, Seq. ID  
5 No. 297, Seq. ID No. 301, Seq. ID No. 305, Seq. ID No. 307, Seq. ID No. 309, Seq. ID  
No. 313, Seq. ID No. 317, Seq. ID No. 321, Seq. ID No. 323, Seq. ID No. 325, Seq. ID  
No. 331, Seq. ID No. 333, Seq. ID No. 335, Seq. ID No. 337, Seq. ID No. 339, Seq. ID  
No. 343, Seq. ID No. 345, Seq. ID No. 347, Seq. ID No. 349, Seq. ID No. 353, Seq. ID  
No. 355, Seq. ID No. 357, Seq. ID No. 359, Seq. ID No. 361, Seq. ID No. 363, Seq. ID  
10 No. 365, Seq. ID No. 367, Seq. ID No. 369, Seq. ID No. 371, Seq. ID No. 375, Seq. ID  
No. 377, Seq. ID No. 379, Seq. ID No. 383, Seq. ID No. 385, Seq. ID No. 387, Seq. ID  
No. 389, Seq. ID No. 391, Seq. ID No. 393, Seq. ID No. 397, Seq. ID No. 401, Seq. ID  
No. 403, Seq. ID No. 405, Seq. ID No. 407, Seq. ID No. 409, Seq. ID No. 415, Seq. ID  
No. 423, Seq. ID No. 425, Seq. ID No. 427, Seq. ID No. 429, Seq. ID No. 431, Seq. ID  
15 No. 433, Seq. ID No. 435, Seq. ID No. 437, Seq. ID No. 439, Seq. ID No. 441, Seq. ID  
No. 443, Seq. ID No. 445, Seq. ID No. 447, Seq. ID No. 451, Seq. ID No. 453, Seq. ID  
No. 455, Seq. ID No. 457, Seq. ID No. 461, Seq. ID No. 463, Seq. ID No. 467, Seq. ID  
No. 469, Seq. ID No. 471, Seq. ID No. 473, Seq. ID No. 475, Seq. ID No. 477, Seq. ID  
No. 479, Seq. ID No. 481, Seq. ID No. 483, Seq. ID No. 485, Seq. ID No. 489, Seq. ID  
20 No. 491, Seq. ID No. 493, Seq. ID No. 495, Seq. ID No. 501, Seq. ID No. 505, Seq. ID  
No. 507, Seq. ID No. 511, Seq. ID No. 515, Seq. ID No. 517, Seq. ID No. 523, Seq. ID  
No. 529, Seq. ID No. 531, Seq. ID No. 533, Seq. ID No. 537, Seq. ID No. 539, Seq. ID  
No. 543, Seq. ID No. 547, Seq. ID No. 549, Seq. ID No. 551, Seq. ID No. 553, Seq. ID  
No. 555, Seq. ID No. 557, Seq. ID No. 559, Seq. ID No. 561, Seq. ID No. 565, Seq. ID  
25 No. 569, Seq. ID No. 571, Seq. ID No. 573, Seq. ID No. 575, Seq. ID No. 579, Seq. ID  
No. 581, Seq. ID No. 585, Seq. ID No. 587, Seq. ID No. 589, Seq. ID No. 591, Seq. ID  
No. 593, Seq. ID No. 595, Seq. ID No. 597, Seq. ID No. 599, Seq. ID No. 601, Seq. ID  
No. 603, Seq. ID No. 605, Seq. ID No. 609, Seq. ID No. 613, Seq. ID No. 615, Seq. ID  
No. 617, Seq. ID No. 619, Seq. ID No. 621, Seq. ID No. 623, Seq. ID No. 625, Seq. ID  
30 No. 627, Seq. ID No. 635, Seq. ID No. 637, Seq. ID No. 643, Seq. ID No. 645, Seq. ID  
No. 647, Seq. ID No. 649, Seq. ID No. 655, Seq. ID No. 663, Seq. ID No. 665, Seq. ID  
No. 667, Seq. ID No. 669, Seq. ID No. 675, Seq. ID No. 681, Seq. ID No. 683, Seq. ID  
No. 687, Seq. ID No. 689, Seq. ID No. 691, Seq. ID No. 695, Seq. ID No. 697, Seq. ID

No. 699, Seq. ID No. 701, Seq. ID No. 703, Seq. ID No. 705, Seq. ID No. 707, Seq. ID  
No. 709, Seq. ID No. 713, Seq. ID No. 725, Seq. ID No. 727, Seq. ID No. 729, Seq. ID  
No. 731, Seq. ID No. 733, Seq. ID No. 735, Seq. ID No. 739, Seq. ID No. 741, Seq. ID  
No. 745, Seq. ID No. 747, Seq. ID No. 749, Seq. ID No. 751, Seq. ID No. 753, Seq. ID  
5 No. 759, Seq. ID No. 763, Seq. ID No. 765, Seq. ID No. 773, Seq. ID No. 775, Seq. ID  
No. 781, Seq. ID No. 783, Seq. ID No. 787, Seq. ID No. 793, Seq. ID No. 795, Seq. ID  
No. 799, Seq. ID No. 801, Seq. ID No. 805, Seq. ID No. 807, Seq. ID No. 809, Seq. ID  
No. 811, Seq. ID No. 813, Seq. ID No. 815, Seq. ID No. 817, Seq. ID No. 819, Seq. ID  
No. 821, Seq. ID No. 823, Seq. ID No. 827, Seq. ID No. 829, Seq. ID No. 831, Seq. ID  
10 No. 835, Seq. ID No. 837, Seq. ID No. 839, Seq. ID No. 843, Seq. ID No. 845, Seq. ID  
No. 847, Seq. ID No. 855, Seq. ID No. 859, Seq. ID No. 861, Seq. ID No. 865, Seq. ID  
No. 867, Seq. ID No. 871, Seq. ID No. 873, Seq. ID No. 875, Seq. ID No. 877, Seq. ID  
No. 879, Seq. ID No. 881, Seq. ID No. 885, Seq. ID No. 895, Seq. ID No. 897, Seq. ID  
No. 899, Seq. ID No. 901, Seq. ID No. 903, Seq. ID No. 905, Seq. ID No. 907, Seq. ID  
15 No. 909, Seq. ID No. 913, Seq. ID No. 915, Seq. ID No. 921, Seq. ID No. 923, Seq. ID  
No. 925, Seq. ID No. 931, Seq. ID No. 933, Seq. ID No. 935, Seq. ID No. 937, Seq. ID  
No. 939, Seq. ID No. 941, Seq. ID No. 943, Seq. ID No. 947, Seq. ID No. 949, Seq. ID  
No. 951, Seq. ID No. 953, Seq. ID No. 955, Seq. ID No. 957, Seq. ID No. 961, Seq. ID  
No. 963, Seq. ID No. 965, Seq. ID No. 967, Seq. ID No. 969, Seq. ID No. 971, Seq. ID  
20 No. 973, Seq. ID No. 975, Seq. ID No. 981, Seq. ID No. 983, Seq. ID No. 985, Seq. ID  
No. 987, Seq. ID No. 989, Seq. ID No. 991, Seq. ID No. 993, Seq. ID No. 995, Seq. ID  
No. 997, Seq. ID No. 1001, Seq. ID No. 1003, Seq. ID No. 1005, Seq. ID No. 1007, Seq.  
ID No. 1009, Seq. ID No. 1017, Seq. ID No. 1019, Seq. ID No. 1023, Seq. ID No. 1025,  
Seq. ID No. 1027, Seq. ID No. 1039, Seq. ID No. 1041, Seq. ID No. 1043, Seq. ID No.  
25 1045, Seq. ID No. 1047, Seq. ID No. 1049, Seq. ID No. 1051, Seq. ID No. 1057, Seq. ID  
No. 1059, Seq. ID No. 1061, Seq. ID No. 1065, Seq. ID No. 1069, Seq. ID No. 1075,  
Seq. ID No. 1077, Seq. ID No. 1079, Seq. ID No. 1081, Seq. ID No. 1083, Seq. ID No.  
1085, Seq. ID No. 1087, Seq. ID No. 1091, Seq. ID No. 1093, Seq. ID No. 1095, Seq. ID  
No. 1097, Seq. ID No. 1099, Seq. ID No. 1101, Seq. ID No. 1103, Seq. ID No. 1107,  
30 Seq. ID No. 1109, Seq. ID No. 1111, Seq. ID No. 1113, Seq. ID No. 1115, Seq. ID No.  
1119, Seq. ID No. 1121, Seq. ID No. 1123, Seq. ID No. 1125, Seq. ID No. 1127, Seq. ID  
No. 1129, Seq. ID No. 1131, Seq. ID No. 1137, Seq. ID No. 1139, Seq. ID No. 1141,  
Seq. ID No. 1143, Seq. ID No. 1145, Seq. ID No. 1147, Seq. ID No. 1149, Seq. ID No.

1151, Seq. ID No. 1153, Seq. ID No. 1155, Seq. ID No. 1157, Seq. ID No. 1159, Seq. ID  
No. 1161, Seq. ID No. 1163, Seq. ID No. 1171, Seq. ID No. 1175, Seq. ID No. 1177,  
Seq. ID No. 1179, Seq. ID No. 1181, Seq. ID No. 1187, Seq. ID No. 1191, Seq. ID No.  
1193, Seq. ID No. 1195, Seq. ID No. 1197, Seq. ID No. 1201, Seq. ID No. 1203, Seq. ID  
5 No. 1205, Seq. ID No. 1207, Seq. ID No. 1211, Seq. ID No. 1213, Seq. ID No. 1215,  
Seq. ID No. 1217, Seq. ID No. 1221, Seq. ID No. 1223, Seq. ID No. 1225, Seq. ID No.  
1231, Seq. ID No. 1233, Seq. ID No. 1237, Seq. ID No. 1239, Seq. ID No. 1241, Seq. ID  
No. 1245, Seq. ID No. 1247, Seq. ID No. 1249, Seq. ID No. 1251, Seq. ID No. 1253,  
Seq. ID No. 1255, Seq. ID No. 1257, Seq. ID No. 1259, Seq. ID No. 1261, Seq. ID No.  
10 1263, Seq. ID No. 1271, Seq. ID No. 1273, Seq. ID No. 1275, Seq. ID No. 1277, Seq. ID  
No. 1279, Seq. ID No. 1285, Seq. ID No. 1289, Seq. ID No. 1291, Seq. ID No. 1293,  
Seq. ID No. 1295, Seq. ID No. 1297, Seq. ID No. 1299, Seq. ID No. 1301, Seq. ID No.  
1303, Seq. ID No. 1305, Seq. ID No. 1307, Seq. ID No. 1309, Seq. ID No. 1311, Seq. ID  
No. 1313, Seq. ID No. 1317, Seq. ID No. 1319, Seq. ID No. 1321, Seq. ID No. 1331,  
15 Seq. ID No. 1333, Seq. ID No. 1335, Seq. ID No. 1337, Seq. ID No. 1339, Seq. ID No.  
1343, Seq. ID No. 1345, Seq. ID No. 1347, Seq. ID No. 1349, Seq. ID No. 1351, Seq. ID  
No. 1359, Seq. ID No. 1361, Seq. ID No. 1363, Seq. ID No. 1365, Seq. ID No. 1369,  
Seq. ID No. 1371, Seq. ID No. 1375, Seq. ID No. 1377, Seq. ID No. 1381, Seq. ID No.  
1383, Seq. ID No. 1385, Seq. ID No. 1387, Seq. ID No. 1389, Seq. ID No. 1391, Seq. ID  
20 No. 1393, Seq. ID No. 1401, Seq. ID No. 1403, Seq. ID No. 1407, Seq. ID No. 1409,  
Seq. ID No. 1411, Seq. ID No. 1413, Seq. ID No. 1415, Seq. ID No. 1419, Seq. ID No.  
1421, Seq. ID No. 1423, Seq. ID No. 1425, Seq. ID No. 1427, Seq. ID No. 1429, Seq. ID  
No. 1433, Seq. ID No. 1437, Seq. ID No. 1441, Seq. ID No. 1443, Seq. ID No. 1447,  
Seq. ID No. 1449, Seq. ID No. 1451, Seq. ID No. 1455, Seq. ID No. 1459, Seq. ID No.  
25 1463, Seq. ID No. 1465, Seq. ID No. 1467, Seq. ID No. 1469, Seq. ID No. 1471, Seq. ID  
No. 1473, Seq. ID No. 1475, Seq. ID No. 1477, Seq. ID No. 1479, Seq. ID No. 1483,  
Seq. ID No. 1485, Seq. ID No. 1487, Seq. ID No. 1491, Seq. ID No. 1493, Seq. ID No.  
1495, Seq. ID No. 1497, Seq. ID No. 1499, Seq. ID No. 1501, Seq. ID No. 1505, Seq. ID  
No. 1507, Seq. ID No. 1511, Seq. ID No. 1517, Seq. ID No. 1519, Seq. ID No. 1523,  
30 Seq. ID No. 1525, Seq. ID No. 1527, Seq. ID No. 1531, Seq. ID No. 1539, Seq. ID No.  
1543, Seq. ID No. 1549, Seq. ID No. 1551, Seq. ID No. 1553, Seq. ID No. 1555, Seq. ID  
No. 1557, Seq. ID No. 1561, Seq. ID No. 1563, Seq. ID No. 1565, Seq. ID No. 1567,  
Seq. ID No. 1571, Seq. ID No. 1573, Seq. ID No. 1575, Seq. ID No. 1577, Seq. ID No.

1579, Seq. ID No. 1581, Seq. ID No. 1589, Seq. ID No. 1593, Seq. ID No. 1595, Seq. ID  
No. 1597, Seq. ID No. 1599, Seq. ID No. 1601, Seq. ID No. 1607, Seq. ID No. 1611,  
Seq. ID No. 1613, Seq. ID No. 1615, Seq. ID No. 1617, Seq. ID No. 1619, Seq. ID No.  
1623, Seq. ID No. 1625, Seq. ID No. 1627, Seq. ID No. 1633, Seq. ID No. 1637, Seq. ID  
5 No. 1639, Seq. ID No. 1641, Seq. ID No. 1643, Seq. ID No. 1647, Seq. ID No. 1651,  
Seq. ID No. 1653, Seq. ID No. 1655, Seq. ID No. 1657, Seq. ID No. 1661, Seq. ID No.  
1663, Seq. ID No. 1665, Seq. ID No. 1669, Seq. ID No. 1675, Seq. ID No. 1679, Seq. ID  
No. 1681, Seq. ID No. 1685, Seq. ID No. 1687, Seq. ID No. 1689, Seq. ID No. 1691,  
Seq. ID No. 1693, Seq. ID No. 1695, Seq. ID No. 1697, Seq. ID No. 1699, Seq. ID No.  
10 1703, Seq. ID No. 1705, Seq. ID No. 1707, Seq. ID No. 1711, Seq. ID No. 1713, Seq. ID  
No. 1715, Seq. ID No. 1717, Seq. ID No. 1719, Seq. ID No. 1721, Seq. ID No. 1723,  
Seq. ID No. 1727, Seq. ID No. 1729, Seq. ID No. 1735, Seq. ID No. 1737, Seq. ID No.  
1739, Seq. ID No. 1741, Seq. ID No. 1747, Seq. ID No. 1749, Seq. ID No. 1751, Seq. ID  
No. 1755, Seq. ID No. 1757, Seq. ID No. 1759, Seq. ID No. 1763, Seq. ID No. 1769,  
15 Seq. ID No. 1771, Seq. ID No. 1775, Seq. ID No. 1777, Seq. ID No. 1779, Seq. ID No.  
1781, Seq. ID No. 1783, Seq. ID No. 1785, Seq. ID No. 1789, Seq. ID No. 1791, Seq. ID  
No. 1793, Seq. ID No. 1795, Seq. ID No. 1797, Seq. ID No. 1805, Seq. ID No. 1809,  
Seq. ID No. 1811, Seq. ID No. 1813, Seq. ID No. 1815, Seq. ID No. 1817, Seq. ID No.  
1819, Seq. ID No. 1821, Seq. ID No. 1823, Seq. ID No. 1825, Seq. ID No. 1829, Seq. ID  
20 No. 1833, Seq. ID No. 1841, Seq. ID No. 1843, Seq. ID No. 1845, Seq. ID No. 1847,  
Seq. ID No. 1849, Seq. ID No. 1853, Seq. ID No. 1855, Seq. ID No. 1857, Seq. ID No.  
1859, Seq. ID No. 1861, Seq. ID No. 1863, Seq. ID No. 1865, Seq. ID No. 1867, Seq. ID  
No. 1871, Seq. ID No. 1873, Seq. ID No. 1875, Seq. ID No. 1877, Seq. ID No. 1881,  
Seq. ID No. 1883, Seq. ID No. 1885, Seq. ID No. 1887, Seq. ID No. 1889, Seq. ID No.  
25 1895, Seq. ID No. 1903, Seq. ID No. 1905, Seq. ID No. 1907, Seq. ID No. 1911, Seq. ID  
No. 1913, Seq. ID No. 1915, Seq. ID No. 1919, Seq. ID No. 1923, Seq. ID No. 1925,  
Seq. ID No. 1927, Seq. ID No. 1929, Seq. ID No. 1931, Seq. ID No. 1935, Seq. ID No.  
1941, Seq. ID No. 1943, Seq. ID No. 1945, Seq. ID No. 1947, Seq. ID No. 1949, Seq. ID  
No. 1951, Seq. ID No. 1953, Seq. ID No. 1959, Seq. ID No. 1961, Seq. ID No. 1963,  
30 Seq. ID No. 1965, Seq. ID No. 1967, Seq. ID No. 1969, Seq. ID No. 1971, Seq. ID No.  
1979, Seq. ID No. 1983, Seq. ID No. 1985, Seq. ID No. 1987, Seq. ID No. 1989, Seq. ID  
No. 1991, Seq. ID No. 1995, Seq. ID No. 1997, Seq. ID No. 1999, Seq. ID No. 2001,  
Seq. ID No. 2003, Seq. ID No. 2005, Seq. ID No. 2007, Seq. ID No. 2015, Seq. ID No.

2019, Seq. ID No. 2021, Seq. ID No. 2025, Seq. ID No. 2027, Seq. ID No. 2029, Seq. ID  
No. 2031, Seq. ID No. 2035, Seq. ID No. 2037, Seq. ID No. 2041, Seq. ID No. 2043,  
Seq. ID No. 2045, Seq. ID No. 2047, Seq. ID No. 2053, Seq. ID No. 2055, Seq. ID No.  
2059, Seq. ID No. 2063, Seq. ID No. 2065, Seq. ID No. 2067, Seq. ID No. 2069, Seq. ID  
5 No. 2071, Seq. ID No. 2073, Seq. ID No. 2075, Seq. ID No. 2077, Seq. ID No. 2079,  
Seq. ID No. 2081, Seq. ID No. 2083, Seq. ID No. 2085, Seq. ID No. 2089, Seq. ID No.  
2091, Seq. ID No. 2093, Seq. ID No. 2097, Seq. ID No. 2099, Seq. ID No. 2101, Seq. ID  
No. 2103, Seq. ID No. 2107, Seq. ID No. 2109, Seq. ID No. 2111, Seq. ID No. 2115,  
Seq. ID No. 2117, Seq. ID No. 2119, Seq. ID No. 2125, Seq. ID No. 2127, Seq. ID No.  
10 2129, Seq. ID No. 2131, Seq. ID No. 2133, Seq. ID No. 2135, Seq. ID No. 2137, Seq. ID  
No. 2141, Seq. ID No. 2143, Seq. ID No. 2145, Seq. ID No. 2149, Seq. ID No. 2151,  
Seq. ID No. 2153, Seq. ID No. 2155, Seq. ID No. 2157, Seq. ID No. 2159, Seq. ID No.  
2161, Seq. ID No. 2165, Seq. ID No. 2167, Seq. ID No. 2169, Seq. ID No. 2179, Seq. ID  
No. 2181, Seq. ID No. 2183, Seq. ID No. 2189, Seq. ID No. 2191, Seq. ID No. 2195,  
15 Seq. ID No. 2197, Seq. ID No. 2199, Seq. ID No. 2201, Seq. ID No. 2203, Seq. ID No.  
2205, Seq. ID No. 2207, Seq. ID No. 2209, Seq. ID No. 2211, Seq. ID No. 2213, Seq. ID  
No. 2215, Seq. ID No. 2217, Seq. ID No. 2221, Seq. ID No. 2223, Seq. ID No. 2227,  
Seq. ID No. 2229, Seq. ID No. 2235, Seq. ID No. 2241, Seq. ID No. 2245, Seq. ID No.  
2247, Seq. ID No. 2251, Seq. ID No. 2253, Seq. ID No. 2257, Seq. ID No. 2259, Seq. ID  
20 No. 2261, Seq. ID No. 2263, Seq. ID No. 2265, Seq. ID No. 2267, Seq. ID No. 2269,  
Seq. ID No. 2275, Seq. ID No. 2277, Seq. ID No. 2279, Seq. ID No. 2285, Seq. ID No.  
2287, Seq. ID No. 2297, Seq. ID No. 2299, Seq. ID No. 2301, Seq. ID No. 2309, Seq. ID  
No. 2311, Seq. ID No. 2315, Seq. ID No. 2327, Seq. ID No. 2329, Seq. ID No. 2333,  
Seq. ID No. 2343, Seq. ID No. 2345, Seq. ID No. 2349, Seq. ID No. 2351, Seq. ID No.  
25 2357, Seq. ID No. 2363, Seq. ID No. 2365, Seq. ID No. 2367, Seq. ID No. 2369, Seq. ID  
No. 2371, Seq. ID No. 2373, Seq. ID No. 2375, Seq. ID No. 2379, Seq. ID No. 2381,  
Seq. ID No. 2385, Seq. ID No. 2387, Seq. ID No. 2391, Seq. ID No. 2393, Seq. ID No.  
2395, Seq. ID No. 2397, Seq. ID No. 2399, Seq. ID No. 2401, Seq. ID No. 2405, Seq. ID  
No. 2409, Seq. ID No. 2413, Seq. ID No. 2415, Seq. ID No. 2417, Seq. ID No. 2421,  
30 Seq. ID No. 2423, Seq. ID No. 2425, Seq. ID No. 2427, Seq. ID No. 2429, Seq. ID No.  
2435, Seq. ID No. 2437, Seq. ID No. 2445, Seq. ID No. 2447, Seq. ID No. 2449, Seq. ID  
No. 2451, Seq. ID No. 2453, Seq. ID No. 2455, Seq. ID No. 2457, Seq. ID No. 2459,  
Seq. ID No. 2461, Seq. ID No. 2463, Seq. ID No. 2465, Seq. ID No. 2469, Seq. ID No.

2471, Seq. ID No. 2475, Seq. ID No. 2481, Seq. ID No. 2483, Seq. ID No. 2485, Seq. ID  
No. 2491, Seq. ID No. 2493, Seq. ID No. 2495, Seq. ID No. 2499, Seq. ID No. 2501,  
Seq. ID No. 2503, Seq. ID No. 2505, Seq. ID No. 2507, Seq. ID No. 2511, Seq. ID No.  
2513, Seq. ID No. 2517, Seq. ID No. 2519, Seq. ID No. 2521, Seq. ID No. 2525, Seq. ID  
5 No. 2529, Seq. ID No. 2533, Seq. ID No. 2535, Seq. ID No. 2537, Seq. ID No. 2539,  
Seq. ID No. 2547, Seq. ID No. 2549, Seq. ID No. 2551, Seq. ID No. 2553, Seq. ID No.  
2559, Seq. ID No. 2561, Seq. ID No. 2563, Seq. ID No. 2565, Seq. ID No. 2573, Seq. ID  
No. 2575, Seq. ID No. 2577, Seq. ID No. 2579, Seq. ID No. 2581, Seq. ID No. 2587,  
Seq. ID No. 2589, Seq. ID No. 2591, Seq. ID No. 2593, Seq. ID No. 2595, Seq. ID No.  
10 2599, Seq. ID No. 2603, Seq. ID No. 2605, Seq. ID No. 2607, Seq. ID No. 2609, Seq. ID  
No. 2611, Seq. ID No. 2613, Seq. ID No. 2617, Seq. ID No. 2619, Seq. ID No. 2623,  
Seq. ID No. 2625, Seq. ID No. 2627, Seq. ID No. 2629, Seq. ID No. 2631, Seq. ID No.  
2633, Seq. ID No. 2635, Seq. ID No. 2637, Seq. ID No. 2639, Seq. ID No. 2641, Seq. ID  
No. 2643, Seq. ID No. 2645, Seq. ID No. 2647, Seq. ID No. 2649, Seq. ID No. 2651,  
15 Seq. ID No. 2653, Seq. ID No. 2655, Seq. ID No. 2659, Seq. ID No. 2663, Seq. ID No.  
2667, Seq. ID No. 2669, Seq. ID No. 2671, Seq. ID No. 2675, Seq. ID No. 2677, Seq. ID  
No. 2683, Seq. ID No. 2685, Seq. ID No. 2687, Seq. ID No. 2689, Seq. ID No. 2691,  
Seq. ID No. 2693, Seq. ID No. 2695, Seq. ID No. 2697, Seq. ID No. 2699, Seq. ID No.  
2703, Seq. ID No. 2709, Seq. ID No. 2711, Seq. ID No. 2715, Seq. ID No. 2717, Seq. ID  
20 No. 2719, Seq. ID No. 2723, Seq. ID No. 2725, Seq. ID No. 2727, Seq. ID No. 2729,  
Seq. ID No. 2731, Seq. ID No. 2735, Seq. ID No. 2737, Seq. ID No. 2739, Seq. ID No.  
2749, Seq. ID No. 2751, Seq. ID No. 2753, Seq. ID No. 2755, Seq. ID No. 2759, Seq. ID  
No. 2765, Seq. ID No. 2767, Seq. ID No. 2769, Seq. ID No. 2771, Seq. ID No. 2773,  
Seq. ID No. 2775, Seq. ID No. 2779, Seq. ID No. 2781, Seq. ID No. 2783, Seq. ID No.  
25 2787, Seq. ID No. 2789, Seq. ID No. 2791, Seq. ID No. 2793, Seq. ID No. 2795, Seq. ID  
No. 2797, Seq. ID No. 2799, Seq. ID No. 2801, Seq. ID No. 2803, Seq. ID No. 2807,  
Seq. ID No. 2809, Seq. ID No. 2813, Seq. ID No. 2815, Seq. ID No. 2821, Seq. ID No.  
2823, Seq. ID No. 2827, Seq. ID No. 2829, Seq. ID No. 2831, Seq. ID No. 2833, Seq. ID  
No. 2839, Seq. ID No. 2841, Seq. ID No. 2843, Seq. ID No. 2845, Seq. ID No. 2847,  
30 Seq. ID No. 2855, Seq. ID No. 2861, Seq. ID No. 2863, Seq. ID No. 2865, Seq. ID No.  
2867, Seq. ID No. 2869, Seq. ID No. 2871, Seq. ID No. 2877, Seq. ID No. 2881, Seq. ID  
No. 2883, Seq. ID No. 2885, Seq. ID No. 2887, Seq. ID No. 2891, Seq. ID No. 2893,  
Seq. ID No. 2895, Seq. ID No. 2899, Seq. ID No. 2901, Seq. ID No. 2907, Seq. ID No.



2915, Seq. ID No. 2917, Seq. ID No. 2919, Seq. ID No. 2921, Seq. ID No. 2923, Seq. ID  
No. 2927, Seq. ID No. 2931, Seq. ID No. 2933, Seq. ID No. 2935, Seq. ID No. 2943,  
Seq. ID No. 2945, Seq. ID No. 2951, Seq. ID No. 2953, Seq. ID No. 2957, Seq. ID No.  
2959, Seq. ID No. 2961, Seq. ID No. 2963, Seq. ID No. 2965, Seq. ID No. 2967, Seq. ID  
5 No. 2971, Seq. ID No. 2973, Seq. ID No. 2975, Seq. ID No. 2977, Seq. ID No. 2979,  
Seq. ID No. 2983, Seq. ID No. 2985, Seq. ID No. 2987, Seq. ID No. 2991, Seq. ID No.  
2993, Seq. ID No. 2999, Seq. ID No. 3001, Seq. ID No. 3005, Seq. ID No. 3009, Seq. ID  
No. 3011, Seq. ID No. 3015, Seq. ID No. 3017, Seq. ID No. 3019, Seq. ID No. 3021,  
Seq. ID No. 3027, Seq. ID No. 3033, Seq. ID No. 3035, Seq. ID No. 3037, Seq. ID No.  
10 3039, Seq. ID No. 3043, Seq. ID No. 3045, Seq. ID No. 3047, Seq. ID No. 3049, Seq. ID  
No. 3051, Seq. ID No. 3053, Seq. ID No. 3055, Seq. ID No. 3057, Seq. ID No. 3059,  
Seq. ID No. 3067, Seq. ID No. 3069, Seq. ID No. 3071, Seq. ID No. 3079, Seq. ID No.  
3083, Seq. ID No. 3085, Seq. ID No. 3087, Seq. ID No. 3091, Seq. ID No. 3093, Seq. ID  
No. 3099, Seq. ID No. 3101, Seq. ID No. 3103, Seq. ID No. 3109, Seq. ID No. 3111,  
15 Seq. ID No. 3115, Seq. ID No. 3117, Seq. ID No. 3119, Seq. ID No. 3121, Seq. ID No.  
3123, Seq. ID No. 3125, Seq. ID No. 3129, Seq. ID No. 3131, Seq. ID No. 3133, Seq. ID  
No. 3135, Seq. ID No. 3137, Seq. ID No. 3139, Seq. ID No. 3141, Seq. ID No. 3143,  
Seq. ID No. 3147, Seq. ID No. 3149, Seq. ID No. 3151, Seq. ID No. 3153, Seq. ID No.  
3155, Seq. ID No. 3157, Seq. ID No. 3159, Seq. ID No. 3161, Seq. ID No. 3165, Seq. ID  
20 No. 3167, Seq. ID No. 3169, Seq. ID No. 3171, Seq. ID No. 3173, Seq. ID No. 3179,  
Seq. ID No. 3181, Seq. ID No. 3183, Seq. ID No. 3185, Seq. ID No. 3187, Seq. ID No.  
3189, Seq. ID No. 3191, Seq. ID No. 3193, Seq. ID No. 3195, Seq. ID No. 3197, Seq. ID  
No. 3203, Seq. ID No. 3205, Seq. ID No. 3207, Seq. ID No. 3209, Seq. ID No. 3211,  
Seq. ID No. 3217, Seq. ID No. 3223, Seq. ID No. 3225, Seq. ID No. 3227, Seq. ID No.  
25 3229, Seq. ID No. 3235, Seq. ID No. 3249, Seq. ID No. 3251, Seq. ID No. 3253, Seq. ID  
No. 3255, Seq. ID No. 3257, Seq. ID No. 3259, Seq. ID No. 3263, Seq. ID No. 3265,  
Seq. ID No. 3269, Seq. ID No. 3271, Seq. ID No. 3273, Seq. ID No. 3277, Seq. ID No.  
3281, Seq. ID No. 3283, Seq. ID No. 3285, Seq. ID No. 3289, Seq. ID No. 3291, Seq. ID  
No. 3293, Seq. ID No. 3299, Seq. ID No. 3301, Seq. ID No. 3303, Seq. ID No. 3305,  
30 Seq. ID No. 3307, Seq. ID No. 3309, Seq. ID No. 3311, Seq. ID No. 3313, Seq. ID No.  
3315, Seq. ID No. 3319, Seq. ID No. 3321, Seq. ID No. 3323, Seq. ID No. 3325, Seq. ID  
No. 3331, Seq. ID No. 3335, Seq. ID No. 3337, Seq. ID No. 3339, Seq. ID No. 3341,  
Seq. ID No. 3345, Seq. ID No. 3347, Seq. ID No. 3349, Seq. ID No. 3353, Seq. ID No.

3355, Seq. ID No. 3359, Seq. ID No. 3361, Seq. ID No. 3363, Seq. ID No. 3365, Seq. ID  
No. 3367, Seq. ID No. 3369, Seq. ID No. 3371, Seq. ID No. 3373, Seq. ID No. 3375,  
Seq. ID No. 3377, Seq. ID No. 3379, Seq. ID No. 3381, Seq. ID No. 3383, Seq. ID No.  
3397, Seq. ID No. 3399, Seq. ID No. 3401, Seq. ID No. 3407, Seq. ID No. 3409, Seq. ID  
5 No. 3413, Seq. ID No. 3415, Seq. ID No. 3419, Seq. ID No. 3425, Seq. ID No. 3427,  
Seq. ID No. 3431, Seq. ID No. 3433, Seq. ID No. 3435, Seq. ID No. 3439, Seq. ID No.  
3441, Seq. ID No. 3443, Seq. ID No. 3445, Seq. ID No. 3447, Seq. ID No. 3455, Seq. ID  
No. 3457, Seq. ID No. 3459, Seq. ID No. 3461, Seq. ID No. 3465, Seq. ID No. 3467,  
Seq. ID No. 3471, Seq. ID No. 3473, Seq. ID No. 3475, Seq. ID No. 3479, Seq. ID No.  
10 3483, Seq. ID No. 3485, Seq. ID No. 3487, Seq. ID No. 3489, Seq. ID No. 3495, Seq. ID  
No. 3497, Seq. ID No. 3499, Seq. ID No. 3501, Seq. ID No. 3505, Seq. ID No. 3507,  
Seq. ID No. 3509, Seq. ID No. 3511, Seq. ID No. 3513, Seq. ID No. 3517, Seq. ID No.  
3519, Seq. ID No. 3521, Seq. ID No. 3525, Seq. ID No. 3529, Seq. ID No. 3531, Seq. ID  
No. 3533, Seq. ID No. 3535, Seq. ID No. 3537, Seq. ID No. 3539, Seq. ID No. 3541,  
15 Seq. ID No. 3543, Seq. ID No. 3545, Seq. ID No. 3547, Seq. ID No. 3549, Seq. ID No.  
3551, Seq. ID No. 3553, Seq. ID No. 3555, Seq. ID No. 3557, Seq. ID No. 3559, Seq. ID  
No. 3561, Seq. ID No. 3563, Seq. ID No. 3565, Seq. ID No. 3567, Seq. ID No. 3569,  
Seq. ID No. 3571, Seq. ID No. 3573, Seq. ID No. 3575, Seq. ID No. 3579, Seq. ID No.  
3581, Seq. ID No. 3583, Seq. ID No. 3587, Seq. ID No. 3589, Seq. ID No. 3595, Seq. ID  
20 No. 3597, Seq. ID No. 3599, Seq. ID No. 3603, Seq. ID No. 3605, Seq. ID No. 3607,  
Seq. ID No. 3609, Seq. ID No. 3611, Seq. ID No. 3613, Seq. ID No. 3615, Seq. ID No.  
3617, Seq. ID No. 3619, Seq. ID No. 3621, Seq. ID No. 3623, Seq. ID No. 3627, Seq. ID  
No. 3629, Seq. ID No. 3635, Seq. ID No. 3637, Seq. ID No. 3639, Seq. ID No. 3641,  
Seq. ID No. 3645, Seq. ID No. 3647, Seq. ID No. 3649, Seq. ID No. 3651, Seq. ID No.  
25 3653, Seq. ID No. 3657, Seq. ID No. 3659, Seq. ID No. 3663, Seq. ID No. 3665, Seq. ID  
No. 3667, Seq. ID No. 3671, Seq. ID No. 3673, Seq. ID No. 3675, Seq. ID No. 3677,  
Seq. ID No. 3679, Seq. ID No. 3681, Seq. ID No. 3683, Seq. ID No. 3685, Seq. ID No.  
3687, Seq. ID No. 3689, Seq. ID No. 3691, Seq. ID No. 3693, Seq. ID No. 3695, Seq. ID  
No. 3699, Seq. ID No. 3701, Seq. ID No. 3703, Seq. ID No. 3705, Seq. ID No. 3707,  
30 Seq. ID No. 3709, Seq. ID No. 3713, Seq. ID No. 3715, Seq. ID No. 3717, Seq. ID No.  
3727, Seq. ID No. 3729, Seq. ID No. 3733, Seq. ID No. 3737, Seq. ID No. 3739, Seq. ID  
No. 3741, Seq. ID No. 3745, Seq. ID No. 3747, Seq. ID No. 3759, Seq. ID No. 3767,  
Seq. ID No. 3769, Seq. ID No. 3771, Seq. ID No. 3779, Seq. ID No. 3783, Seq. ID No.

3785, Seq. ID No. 3789, Seq. ID No. 3791, Seq. ID No. 3795, Seq. ID No. 3797, Seq. ID  
No. 3803, Seq. ID No. 3805, Seq. ID No. 3807, Seq. ID No. 3809, Seq. ID No. 3811,  
Seq. ID No. 3813, Seq. ID No. 3815, Seq. ID No. 3817, Seq. ID No. 3819, Seq. ID No.  
3823, Seq. ID No. 3825, Seq. ID No. 3831, Seq. ID No. 3833, Seq. ID No. 3835, Seq. ID  
5 No. 3841, Seq. ID No. 3843, Seq. ID No. 3847, Seq. ID No. 3855, Seq. ID No. 3857,  
Seq. ID No. 3863, Seq. ID No. 3867, Seq. ID No. 3871, Seq. ID No. 3873, Seq. ID No.  
3875, Seq. ID No. 3877, Seq. ID No. 3881, Seq. ID No. 3883, Seq. ID No. 3885, Seq. ID  
No. 3893, Seq. ID No. 3895, Seq. ID No. 3899, Seq. ID No. 3901, Seq. ID No. 3905,  
Seq. ID No. 3907, Seq. ID No. 3911, Seq. ID No. 3913, Seq. ID No. 3915, Seq. ID No.  
10 3919, Seq. ID No. 3921, Seq. ID No. 3923, Seq. ID No. 3925, Seq. ID No. 3927, Seq. ID  
No. 3929, Seq. ID No. 3931, Seq. ID No. 3933, Seq. ID No. 3935, Seq. ID No. 3939,  
Seq. ID No. 3941, Seq. ID No. 3943, Seq. ID No. 3945, Seq. ID No. 3947, Seq. ID No.  
3949, Seq. ID No. 3951, Seq. ID No. 3953, Seq. ID No. 3955, Seq. ID No. 3957, Seq. ID  
No. 3959, Seq. ID No. 3961, Seq. ID No. 3965, Seq. ID No. 3967, Seq. ID No. 3969,  
15 Seq. ID No. 3971, Seq. ID No. 3975, Seq. ID No. 3979, Seq. ID No. 3981, Seq. ID No.  
3983, Seq. ID No. 3985, Seq. ID No. 3987, Seq. ID No. 3991, Seq. ID No. 3995, Seq. ID  
No. 3997, Seq. ID No. 3999, Seq. ID No. 4003, Seq. ID No. 4007, Seq. ID No. 4009,  
Seq. ID No. 4015, Seq. ID No. 4017, Seq. ID No. 4021, Seq. ID No. 4023, Seq. ID No.  
4029, Seq. ID No. 4035, Seq. ID No. 4037, Seq. ID No. 4039, Seq. ID No. 4049, Seq. ID  
20 No. 4051, Seq. ID No. 4053, Seq. ID No. 4055, Seq. ID No. 4057, Seq. ID No. 4061,  
Seq. ID No. 4075, Seq. ID No. 4079, Seq. ID No. 4085, Seq. ID No. 4087, Seq. ID No.  
4089, Seq. ID No. 4091, Seq. ID No. 4093, Seq. ID No. 4095, Seq. ID No. 4099, Seq. ID  
No. 4105, Seq. ID No. 4107, Seq. ID No. 4109, Seq. ID No. 4111, Seq. ID No. 4113,  
Seq. ID No. 4117, Seq. ID No. 4119, Seq. ID No. 4121, Seq. ID No. 4123, Seq. ID No.  
25 4125, Seq. ID No. 4127, Seq. ID No. 4129, Seq. ID No. 4131, Seq. ID No. 4133, Seq. ID  
No. 4135, Seq. ID No. 4137, Seq. ID No. 4139, Seq. ID No. 4141, Seq. ID No. 4143,  
Seq. ID No. 4145, Seq. ID No. 4149, Seq. ID No. 4153, Seq. ID No. 4155, Seq. ID No.  
4157, Seq. ID No. 4161, Seq. ID No. 4163, Seq. ID No. 4167, Seq. ID No. 4171, Seq. ID  
No. 4173, Seq. ID No. 4175, Seq. ID No. 4177, Seq. ID No. 4179, Seq. ID No. 4181,  
30 Seq. ID No. 4185, Seq. ID No. 4187, Seq. ID No. 4189, Seq. ID No. 4191, Seq. ID No.  
4193, Seq. ID No. 4195, Seq. ID No. 4197, Seq. ID No. 4199, Seq. ID No. 4203, Seq. ID  
No. 4205, Seq. ID No. 4207, Seq. ID No. 4209, Seq. ID No. 4211, Seq. ID No. 4219,  
Seq. ID No. 4229, Seq. ID No. 4233, Seq. ID No. 4235, Seq. ID No. 4237, Seq. ID No.

4239, Seq. ID No. 4243, Seq. ID No. 4249, Seq. ID No. 4251, Seq. ID No. 4253, Seq. ID  
No. 4255, Seq. ID No. 4259, Seq. ID No. 4263, Seq. ID No. 4265, Seq. ID No. 4267,  
Seq. ID No. 4269, Seq. ID No. 4271, Seq. ID No. 4273, Seq. ID No. 4275, Seq. ID No.  
4281, Seq. ID No. 4283, Seq. ID No. 4285, Seq. ID No. 4287, Seq. ID No. 4289, Seq. ID  
5 No. 4291, Seq. ID No. 4293, Seq. ID No. 4295, Seq. ID No. 4297, Seq. ID No. 4299,  
Seq. ID No. 4301, Seq. ID No. 4303, Seq. ID No. 4307, Seq. ID No. 4309, Seq. ID No.  
4313, Seq. ID No. 4315, Seq. ID No. 4317, Seq. ID No. 4319, Seq. ID No. 4321, Seq. ID  
No. 4323, Seq. ID No. 4325, Seq. ID No. 4329, Seq. ID No. 4331, Seq. ID No. 4333,  
Seq. ID No. 4335, Seq. ID No. 4337, Seq. ID No. 4339, Seq. ID No. 4343, Seq. ID No.  
10 4345, Seq. ID No. 4347, Seq. ID No. 4351, Seq. ID No. 4353, Seq. ID No. 4355, Seq. ID  
No. 4359, Seq. ID No. 4361, Seq. ID No. 4363, Seq. ID No. 4365, Seq. ID No. 4367,  
Seq. ID No. 4369, Seq. ID No. 4375, Seq. ID No. 4377, Seq. ID No. 4379, Seq. ID No.  
4383, Seq. ID No. 4389, Seq. ID No. 4391, Seq. ID No. 4393, Seq. ID No. 4395, Seq. ID  
No. 4397, Seq. ID No. 4399, Seq. ID No. 4401, Seq. ID No. 4403, Seq. ID No. 4405,  
15 Seq. ID No. 4407, Seq. ID No. 4409, Seq. ID No. 4411, Seq. ID No. 4413, Seq. ID No.  
4415, Seq. ID No. 4417, Seq. ID No. 4419, Seq. ID No. 4421, Seq. ID No. 4423, Seq. ID  
No. 4425, Seq. ID No. 4427, Seq. ID No. 4429, Seq. ID No. 4431, Seq. ID No. 4435,  
Seq. ID No. 4437, Seq. ID No. 4439, Seq. ID No. 4441, Seq. ID No. 4449, Seq. ID No.  
4451, Seq. ID No. 4453, Seq. ID No. 4455, Seq. ID No. 4457, Seq. ID No. 4459, Seq. ID  
20 No. 4461, Seq. ID No. 4465, Seq. ID No. 4467, Seq. ID No. 4471, Seq. ID No. 4475,  
Seq. ID No. 4477, Seq. ID No. 4479, Seq. ID No. 4481, Seq. ID No. 4485, Seq. ID No.  
4487, Seq. ID No. 4489, Seq. ID No. 4491, Seq. ID No. 4493, Seq. ID No. 4495, Seq. ID  
No. 4497, Seq. ID No. 4501, Seq. ID No. 4503, Seq. ID No. 4505, Seq. ID No. 4507,  
Seq. ID No. 4509, Seq. ID No. 4511, Seq. ID No. 4513, Seq. ID No. 4515, Seq. ID No.  
25 4519, Seq. ID No. 4521, Seq. ID No. 4523, Seq. ID No. 4525, Seq. ID No. 4527, Seq. ID  
No. 4529, Seq. ID No. 4531, Seq. ID No. 4533, Seq. ID No. 4537, Seq. ID No. 4541,  
Seq. ID No. 4545, Seq. ID No. 4547, Seq. ID No. 4549, Seq. ID No. 4551, Seq. ID No.  
4553, Seq. ID No. 4555, Seq. ID No. 4559, Seq. ID No. 4561, Seq. ID No. 4565, Seq. ID  
No. 4567, Seq. ID No. 4571, Seq. ID No. 4573, Seq. ID No. 4575, Seq. ID No. 4577,  
30 Seq. ID No. 4581, Seq. ID No. 4585, Seq. ID No. 4589, Seq. ID No. 4591, Seq. ID No.  
4597, Seq. ID No. 4599, Seq. ID No. 4601, Seq. ID No. 4603, Seq. ID No. 4605, Seq. ID  
No. 4607, Seq. ID No. 4609, Seq. ID No. 4611, Seq. ID No. 4613, Seq. ID No. 4615,  
Seq. ID No. 4617, Seq. ID No. 4619, Seq. ID No. 4621, Seq. ID No. 4623, Seq. ID No.

4627, Seq. ID No. 4631, Seq. ID No. 4637, Seq. ID No. 4641, Seq. ID No. 4643, Seq. ID  
No. 4645, Seq. ID No. 4647, Seq. ID No. 4649, Seq. ID No. 4653, Seq. ID No. 4659,  
Seq. ID No. 4661, Seq. ID No. 4663, Seq. ID No. 4665, Seq. ID No. 4667, Seq. ID No.  
4669, Seq. ID No. 4671, Seq. ID No. 4673, Seq. ID No. 4675, Seq. ID No. 4677, Seq. ID  
5 No. 4679, Seq. ID No. 4683, Seq. ID No. 4685, Seq. ID No. 4687, Seq. ID No. 4691,  
Seq. ID No. 4693, Seq. ID No. 4695, Seq. ID No. 4699, Seq. ID No. 4701, Seq. ID No.  
4703, Seq. ID No. 4705, Seq. ID No. 4713, Seq. ID No. 4717, Seq. ID No. 4719, Seq. ID  
No. 4721, Seq. ID No. 4727, Seq. ID No. 4729, Seq. ID No. 4733, Seq. ID No. 4735,  
Seq. ID No. 4737, Seq. ID No. 4739, Seq. ID No. 4741, Seq. ID No. 4743, Seq. ID No.  
10 4747, Seq. ID No. 4749, Seq. ID No. 4751, Seq. ID No. 4755, Seq. ID No. 4757, Seq. ID  
No. 4763, Seq. ID No. 4765, Seq. ID No. 4767, Seq. ID No. 4769, Seq. ID No. 4773,  
Seq. ID No. 4775, Seq. ID No. 4777, Seq. ID No. 4779, Seq. ID No. 4781, Seq. ID No.  
4787, Seq. ID No. 4789, Seq. ID No. 4791, Seq. ID No. 4793, Seq. ID No. 4795, Seq. ID  
No. 4797, Seq. ID No. 4801, Seq. ID No. 4803, Seq. ID No. 4805, Seq. ID No. 4809,  
15 Seq. ID No. 4811, Seq. ID No. 4813, Seq. ID No. 4815, Seq. ID No. 4817, Seq. ID No.  
4819, Seq. ID No. 4825, Seq. ID No. 4827, Seq. ID No. 4829, Seq. ID No. 4831, Seq. ID  
No. 4833, Seq. ID No. 4837, Seq. ID No. 4839, Seq. ID No. 4841, Seq. ID No. 4843,  
Seq. ID No. 4845, Seq. ID No. 4849, Seq. ID No. 4851, Seq. ID No. 4853, Seq. ID No.  
4855, Seq. ID No. 4861, Seq. ID No. 4863, Seq. ID No. 4867, Seq. ID No. 4875, Seq. ID  
20 No. 4877, Seq. ID No. 4879, Seq. ID No. 4881, Seq. ID No. 4883, Seq. ID No. 4889,  
Seq. ID No. 4891, Seq. ID No. 4893, Seq. ID No. 4895, Seq. ID No. 4897, Seq. ID No.  
4899, Seq. ID No. 4901, Seq. ID No. 4903, Seq. ID No. 4905, Seq. ID No. 4907, Seq. ID  
No. 4909, Seq. ID No. 4911, Seq. ID No. 4913, Seq. ID No. 4915, Seq. ID No. 4917,  
Seq. ID No. 4919, Seq. ID No. 4921, Seq. ID No. 4923, Seq. ID No. 4927, Seq. ID No.  
25 4931, Seq. ID No. 4935, Seq. ID No. 4937, Seq. ID No. 4939, Seq. ID No. 4941, Seq. ID  
No. 4943, Seq. ID No. 4945, Seq. ID No. 4947, Seq. ID No. 4949, Seq. ID No. 4951,  
Seq. ID No. 4953, Seq. ID No. 4957, Seq. ID No. 4959, Seq. ID No. 4961, Seq. ID No.  
4963, Seq. ID No. 4973, Seq. ID No. 4975, Seq. ID No. 4977, Seq. ID No. 4979, Seq. ID  
No. 4981, Seq. ID No. 4983, Seq. ID No. 4985, Seq. ID No. 4987, Seq. ID No. 4989,  
30 Seq. ID No. 4991, Seq. ID No. 4993, Seq. ID No. 4995, Seq. ID No. 4997, Seq. ID No.  
4999, Seq. ID No. 5003, Seq. ID No. 5005, Seq. ID No. 5007, Seq. ID No. 5009, Seq. ID  
No. 5011, Seq. ID No. 5013, Seq. ID No. 5017, Seq. ID No. 5019, Seq. ID No. 5021,  
Seq. ID No. 5023, Seq. ID No. 5025, Seq. ID No. 5029, Seq. ID No. 5031, Seq. ID No.

5033, Seq. ID No. 5035, Seq. ID No. 5041, Seq. ID No. 5043, Seq. ID No. 5045, Seq. ID  
No. 5047, Seq. ID No. 5057, Seq. ID No. 5059, Seq. ID No. 5063, Seq. ID No. 5065,  
Seq. ID No. 5067, Seq. ID No. 5069, Seq. ID No. 5075, Seq. ID No. 5077, Seq. ID No.  
5079, Seq. ID No. 5081, Seq. ID No. 5083, Seq. ID No. 5085, Seq. ID No. 5087, Seq. ID  
5 No. 5091, Seq. ID No. 5099, Seq. ID No. 5101, Seq. ID No. 5103, Seq. ID No. 5109,  
Seq. ID No. 5111, Seq. ID No. 5113, Seq. ID No. 5115, Seq. ID No. 5117, Seq. ID No.  
5121, Seq. ID No. 5125, Seq. ID No. 5127, Seq. ID No. 5133, Seq. ID No. 5139, Seq. ID  
No. 5141, Seq. ID No. 5145, Seq. ID No. 5147, Seq. ID No. 5149, Seq. ID No. 5151,  
Seq. ID No. 5155, Seq. ID No. 5157, Seq. ID No. 5159, Seq. ID No. 5161, Seq. ID No.  
10 5165, Seq. ID No. 5167, Seq. ID No. 5169, Seq. ID No. 5177, Seq. ID No. 5181, Seq. ID  
No. 5183, Seq. ID No. 5185, Seq. ID No. 5187, Seq. ID No. 5189, Seq. ID No. 5191,  
Seq. ID No. 5193, Seq. ID No. 5195, Seq. ID No. 5197, Seq. ID No. 5199, Seq. ID No.  
5201, Seq. ID No. 5203, Seq. ID No. 5205, Seq. ID No. 5209, Seq. ID No. 5211, Seq. ID  
No. 5215, Seq. ID No. 5219, Seq. ID No. 5221, Seq. ID No. 5229, Seq. ID No. 5231,  
15 Seq. ID No. 5239, Seq. ID No. 5241, Seq. ID No. 5243, Seq. ID No. 5245, Seq. ID No.  
5251, Seq. ID No. 5253, Seq. ID No. 5255, Seq. ID No. 5261, Seq. ID No. 5263, Seq. ID  
No. 5265, Seq. ID No. 5267, Seq. ID No. 5277, Seq. ID No. 5279, Seq. ID No. 5281,  
Seq. ID No. 5285, Seq. ID No. 5287, Seq. ID No. 5291, Seq. ID No. 5295, Seq. ID No.  
5297, Seq. ID No. 5299, Seq. ID No. 5301, Seq. ID No. 5303, Seq. ID No. 5305, Seq. ID  
20 No. 5307, Seq. ID No. 5309, Seq. ID No. 5311, Seq. ID No. 5313, Seq. ID No. 5317,  
Seq. ID No. 5319, Seq. ID No. 5321, Seq. ID No. 5323, Seq. ID No. 5327, Seq. ID No.  
5329, Seq. ID No. 5331, Seq. ID No. 5333, Seq. ID No. 5335, Seq. ID No. 5337, Seq. ID  
No. 5343, Seq. ID No. 5345, Seq. ID No. 5349, Seq. ID No. 5351, Seq. ID No. 5357,  
Seq. ID No. 5359, Seq. ID No. 5365, Seq. ID No. 5367, Seq. ID No. 5373, Seq. ID No.  
25 5377, Seq. ID No. 5379, Seq. ID No. 5381, Seq. ID No. 5383, Seq. ID No. 5387, Seq. ID  
No. 5389, Seq. ID No. 5391, Seq. ID No. 5393, Seq. ID No. 5397, Seq. ID No. 5399,  
Seq. ID No. 5401, Seq. ID No. 5403, Seq. ID No. 5405, Seq. ID No. 5407, Seq. ID No.  
5409, Seq. ID No. 5411, Seq. ID No. 5415, Seq. ID No. 5417, Seq. ID No. 5419, Seq. ID  
No. 5421, Seq. ID No. 5423, Seq. ID No. 5425, Seq. ID No. 5427, Seq. ID No. 5431,  
30 Seq. ID No. 5433, Seq. ID No. 5435, Seq. ID No. 5437, Seq. ID No. 5439, Seq. ID No.  
5441, Seq. ID No. 5443, Seq. ID No. 5447, Seq. ID No. 5449, Seq. ID No. 5451, Seq. ID  
No. 5453, Seq. ID No. 5455, Seq. ID No. 5457, Seq. ID No. 5467, Seq. ID No. 5471,  
Seq. ID No. 5473, Seq. ID No. 5477, Seq. ID No. 5479, Seq. ID No. 5481, Seq. ID No.

5491, Seq. ID No. 5493, Seq. ID No. 5495, Seq. ID No. 5499, Seq. ID No. 5503, Seq. ID  
No. 5509, Seq. ID No. 5513, Seq. ID No. 5515, Seq. ID No. 5517, Seq. ID No. 5519,  
Seq. ID No. 5521, Seq. ID No. 5527, Seq. ID No. 5529, Seq. ID No. 5531, Seq. ID No.  
5533, Seq. ID No. 5537, Seq. ID No. 5539, Seq. ID No. 5541, Seq. ID No. 5543, Seq. ID  
5 No. 5545, Seq. ID No. 5547, Seq. ID No. 5549, Seq. ID No. 5551, Seq. ID No. 5553,  
Seq. ID No. 5557, Seq. ID No. 5559, Seq. ID No. 5563, Seq. ID No. 5567, Seq. ID No.  
5569, Seq. ID No. 5575, Seq. ID No. 5577, Seq. ID No. 5581, Seq. ID No. 5583, Seq. ID  
No. 5585, Seq. ID No. 5589, Seq. ID No. 5591, Seq. ID No. 5593, Seq. ID No. 5595,  
Seq. ID No. 5599, Seq. ID No. 5601, Seq. ID No. 5607, Seq. ID No. 5613, Seq. ID No.  
10 5615, Seq. ID No. 5617, Seq. ID No. 5619, Seq. ID No. 5621, Seq. ID No. 5625, Seq. ID  
No. 5627, Seq. ID No. 5629, Seq. ID No. 5631, Seq. ID No. 5637, Seq. ID No. 5639,  
Seq. ID No. 5641, Seq. ID No. 5645, Seq. ID No. 5647, Seq. ID No. 5649, Seq. ID No.  
5651, Seq. ID No. 5655, Seq. ID No. 5657, Seq. ID No. 5661, Seq. ID No. 5665, Seq. ID  
No. 5667, Seq. ID No. 5669, Seq. ID No. 5677, Seq. ID No. 5679, Seq. ID No. 5683,  
15 Seq. ID No. 5685, Seq. ID No. 5687, Seq. ID No. 5689, Seq. ID No. 5691, Seq. ID No.  
5693, Seq. ID No. 5697, Seq. ID No. 5699, Seq. ID No. 5701, Seq. ID No. 5703, Seq. ID  
No. 5705, Seq. ID No. 5707, Seq. ID No. 5711, Seq. ID No. 5713, Seq. ID No. 5715,  
Seq. ID No. 5717, Seq. ID No. 5719, Seq. ID No. 5721, Seq. ID No. 5723, Seq. ID No.  
5725, Seq. ID No. 5727, Seq. ID No. 5735, Seq. ID No. 5739, Seq. ID No. 5741, Seq. ID  
20 No. 5743, Seq. ID No. 5745, Seq. ID No. 5747, Seq. ID No. 5749, Seq. ID No. 5751,  
Seq. ID No. 5753, Seq. ID No. 5755, Seq. ID No. 5757, Seq. ID No. 5759, Seq. ID No.  
5761, Seq. ID No. 5769, Seq. ID No. 5771, Seq. ID No. 5777, Seq. ID No. 5779, Seq. ID  
No. 5783, Seq. ID No. 5787, Seq. ID No. 5791, Seq. ID No. 5795, Seq. ID No. 5799,  
Seq. ID No. 5801, Seq. ID No. 5807, Seq. ID No. 5809, Seq. ID No. 5813, Seq. ID No.  
25 5815, Seq. ID No. 5819, Seq. ID No. 5821, Seq. ID No. 5823, Seq. ID No. 5825, Seq. ID  
No. 5827, Seq. ID No. 5829, Seq. ID No. 5831, Seq. ID No. 5833, Seq. ID No. 5835,  
Seq. ID No. 5837, Seq. ID No. 5839, Seq. ID No. 5841, Seq. ID No. 5845, Seq. ID No.  
5847, Seq. ID No. 5849, Seq. ID No. 5851, Seq. ID No. 5855, Seq. ID No. 5857, Seq. ID  
No. 5859, Seq. ID No. 5861, Seq. ID No. 5863, Seq. ID No. 5865, Seq. ID No. 5869,  
30 Seq. ID No. 5871, Seq. ID No. 5873, Seq. ID No. 5875, Seq. ID No. 5879, Seq. ID No.  
5881, Seq. ID No. 5883, Seq. ID No. 5889, Seq. ID No. 5895, Seq. ID No. 5897, Seq. ID  
No. 5901, Seq. ID No. 5903, Seq. ID No. 5911, Seq. ID No. 5913, Seq. ID No. 5915,  
Seq. ID No. 5917, Seq. ID No. 5919, Seq. ID No. 5927, Seq. ID No. 5929, Seq. ID No.

5933, Seq. ID No. 5935, Seq. ID No. 5937, Seq. ID No. 5941, Seq. ID No. 5945, Seq. ID  
No. 5947, Seq. ID No. 5951, Seq. ID No. 5959, Seq. ID No. 5961, Seq. ID No. 5963,  
Seq. ID No. 5965, Seq. ID No. 5967, Seq. ID No. 5969, Seq. ID No. 5971, Seq. ID No.  
5973, Seq. ID No. 5977, Seq. ID No. 5979, Seq. ID No. 5981, Seq. ID No. 5985, Seq. ID  
5 No. 5987, Seq. ID No. 5989, Seq. ID No. 5991, Seq. ID No. 5993, Seq. ID No. 5995,  
Seq. ID No. 5999, Seq. ID No. 6001, Seq. ID No. 6003, Seq. ID No. 6009, Seq. ID No.  
6011, Seq. ID No. 6013, Seq. ID No. 6015, Seq. ID No. 6017, Seq. ID No. 6025, Seq. ID  
No. 6027, Seq. ID No. 6029, Seq. ID No. 6031, Seq. ID No. 6033, Seq. ID No. 6035,  
Seq. ID No. 6039, Seq. ID No. 6041, Seq. ID No. 6043, Seq. ID No. 6045, Seq. ID No.  
10 6049, Seq. ID No. 6051, Seq. ID No. 6053, Seq. ID No. 6055, Seq. ID No. 6057, Seq. ID  
No. 6061, Seq. ID No. 6063, Seq. ID No. 6065, Seq. ID No. 6069, Seq. ID No. 6071,  
Seq. ID No. 6073, Seq. ID No. 6077, Seq. ID No. 6079, Seq. ID No. 6085, Seq. ID No.  
6087, Seq. ID No. 6089, Seq. ID No. 6093, Seq. ID No. 6095, Seq. ID No. 6101, Seq. ID  
No. 6103, Seq. ID No. 6109, Seq. ID No. 6111, Seq. ID No. 6117, Seq. ID No. 6121,  
15 Seq. ID No. 6123, Seq. ID No. 6129, Seq. ID No. 6131, Seq. ID No. 6133, Seq. ID No.  
6135, Seq. ID No. 6137, Seq. ID No. 6139, Seq. ID No. 6141, Seq. ID No. 6145, Seq. ID  
No. 6151, Seq. ID No. 6155, Seq. ID No. 6157, Seq. ID No. 6159, Seq. ID No. 6165,  
Seq. ID No. 6167, Seq. ID No. 6169, Seq. ID No. 6171, Seq. ID No. 6175, Seq. ID No.  
6177, Seq. ID No. 6181, Seq. ID No. 6187, Seq. ID No. 6193, Seq. ID No. 6195, Seq. ID  
20 No. 6197, Seq. ID No. 6199, Seq. ID No. 6201, Seq. ID No. 6209, Seq. ID No. 6213,  
Seq. ID No. 6215, Seq. ID No. 6217, Seq. ID No. 6219, Seq. ID No. 6231, Seq. ID No.  
6233, Seq. ID No. 6235, Seq. ID No. 6239, Seq. ID No. 6241, Seq. ID No. 6243, Seq. ID  
No. 6249, Seq. ID No. 6257, Seq. ID No. 6259, Seq. ID No. 6261, Seq. ID No. 6263,  
Seq. ID No. 6267, Seq. ID No. 6269, Seq. ID No. 6271, Seq. ID No. 6275, Seq. ID No.  
25 6277, Seq. ID No. 6279, Seq. ID No. 6281, Seq. ID No. 6283, Seq. ID No. 6285, Seq. ID  
No. 6287, Seq. ID No. 6293, Seq. ID No. 6295, Seq. ID No. 6297, Seq. ID No. 6299,  
Seq. ID No. 6305, Seq. ID No. 6309, Seq. ID No. 6311, Seq. ID No. 6315, Seq. ID No.  
6317, Seq. ID No. 6319, Seq. ID No. 6321, Seq. ID No. 6323, Seq. ID No. 6325, Seq. ID  
No. 6327, Seq. ID No. 6329, Seq. ID No. 6331, Seq. ID No. 6335, Seq. ID No. 6337,  
30 Seq. ID No. 6341, Seq. ID No. 6345, Seq. ID No. 6349, Seq. ID No. 6351, Seq. ID No.  
6353, Seq. ID No. 6359, Seq. ID No. 6361, Seq. ID No. 6367, Seq. ID No. 6369, Seq. ID  
No. 6371, Seq. ID No. 6373, Seq. ID No. 6375, Seq. ID No. 6377, Seq. ID No. 6379,  
Seq. ID No. 6381, Seq. ID No. 6385, Seq. ID No. 6389, Seq. ID No. 6393, Seq. ID No.



6395, Seq. ID No. 6399, Seq. ID No. 6409, Seq. ID No. 6411, Seq. ID No. 6413, Seq. ID No. 6417, Seq. ID No. 6421, Seq. ID No. 6423, Seq. ID No. 6425, Seq. ID No. 6427, Seq. ID No. 6429, Seq. ID No. 6431, Seq. ID No. 6441, Seq. ID No. 6443, Seq. ID No. 6445, Seq. ID No. 6451, Seq. ID No. 6453, Seq. ID No. 6459, Seq. ID No. 6461, Seq. ID No. 6463, Seq. ID No. 6465, Seq. ID No. 6467, Seq. ID No. 6469, Seq. ID No. 6471, Seq. ID No. 6473, Seq. ID No. 6479, Seq. ID No. 6483, Seq. ID No. 6493, Seq. ID No. 6495, Seq. ID No. 6497, Seq. ID No. 6501, Seq. ID No. 6503, Seq. ID No. 6505, Seq. ID No. 6507, Seq. ID No. 6511, Seq. ID No. 6517, Seq. ID No. 6523, Seq. ID No. 6525, Seq. ID No. 6535, Seq. ID No. 6537, Seq. ID No. 6539, Seq. ID No. 6541, Seq. ID No. 6543, Seq. ID No. 6545, Seq. ID No. 6547, Seq. ID No. 6549, Seq. ID No. 6551, Seq. ID No. 6553, Seq. ID No. 6555, Seq. ID No. 6557, Seq. ID No. 6559, Seq. ID No. 6563, Seq. ID No. 6573, Seq. ID No. 6575, Seq. ID No. 6577, Seq. ID No. 6579, Seq. ID No. 6583, Seq. ID No. 6585, Seq. ID No. 6587, Seq. ID No. 6591, Seq. ID No. 6597, Seq. ID No. 6601, Seq. ID No. 6603, Seq. ID No. 6605, Seq. ID No. 6609, Seq. ID No. 6611, Seq. ID No. 6613, Seq. ID No. 6615, Seq. ID No. 6617, Seq. ID No. 6619, Seq. ID No. 6621, Seq. ID No. 6623, Seq. ID No. 6627, Seq. ID No. 6629, Seq. ID No. 6631, Seq. ID No. 6633, Seq. ID No. 6637, Seq. ID No. 6639, Seq. ID No. 6643, Seq. ID No. 6645, and Seq. ID No. 6649.

In another preferred embodiment, the invention comprises an isolated polynucleotide of the *Alloiococcus otitidis* genomic sequence encoding a polypeptide, which has been identified by the Applicants' assignee's ORF finder program that searches for a transmembrane domain between two Stop codons and a Start codon immediately upstream of this transmembrane region, and the polynucleotide is selected from Seq. ID No. 7, Seq. ID No. 9, Seq. ID No. 33, Seq. ID No. 47, Seq. ID No. 67, Seq. ID No. 85, Seq. ID No. 87, Seq. ID No. 123, Seq. ID No. 133, Seq. ID No. 141, Seq. ID No. 159, Seq. ID No. 163, Seq. ID No. 191, Seq. ID No. 209, Seq. ID No. 211, Seq. ID No. 215, Seq. ID No. 217, Seq. ID No. 225, Seq. ID No. 235, Seq. ID No. 237, Seq. ID No. 249, Seq. ID No. 251, Seq. ID No. 255, Seq. ID No. 271, Seq. ID No. 277, Seq. ID No. 285, Seq. ID No. 287, Seq. ID No. 289, Seq. ID No. 327, Seq. ID No. 329, Seq. ID No. 373, Seq. ID No. 375, Seq. ID No. 419, Seq. ID No. 487, Seq. ID No. 497, Seq. ID No. 499, Seq. ID No. 503, Seq. ID No. 505, Seq. ID No. 509, Seq. ID No. 511, Seq. ID No. 515, Seq. ID No. 525, Seq. ID No. 527, Seq. ID No. 545, Seq. ID No. 567, Seq. ID No. 569, Seq. ID No. 575, Seq. ID No. 577, Seq. ID No. 579, Seq. ID No. 593, Seq. ID

No. 617, Seq. ID No. 637, Seq. ID No. 639, Seq. ID No. 641, Seq. ID No. 645, Seq. ID  
No. 653, Seq. ID No. 655, Seq. ID No. 659, Seq. ID No. 669, Seq. ID No. 675, Seq. ID  
No. 677, Seq. ID No. 679, Seq. ID No. 715, Seq. ID No. 717, Seq. ID No. 719, Seq. ID  
No. 721, Seq. ID No. 723, Seq. ID No. 747, Seq. ID No. 751, Seq. ID No. 755, Seq. ID  
5 No. 757, Seq. ID No. 759, Seq. ID No. 761, Seq. ID No. 763, Seq. ID No. 769, Seq. ID  
No. 777, Seq. ID No. 779, Seq. ID No. 807, Seq. ID No. 809, Seq. ID No. 819, Seq. ID  
No. 825, Seq. ID No. 863, Seq. ID No. 893, Seq. ID No. 901, Seq. ID No. 935, Seq. ID  
No. 943, Seq. ID No. 955, Seq. ID No. 967, Seq. ID No. 979, Seq. ID No. 1005, Seq. ID  
No. 1009, Seq. ID No. 1011, Seq. ID No. 1013, Seq. ID No. 1015, Seq. ID No. 1019,  
10 Seq. ID No. 1029, Seq. ID No. 1031, Seq. ID No. 1033, Seq. ID No. 1037, Seq. ID No.  
1039, Seq. ID No. 1045, Seq. ID No. 1055, Seq. ID No. 1075, Seq. ID No. 1105, Seq. ID  
No. 1131, Seq. ID No. 1135, Seq. ID No. 1137, Seq. ID No. 1165, Seq. ID No. 1167,  
Seq. ID No. 1169, Seq. ID No. 1183, Seq. ID No. 1193, Seq. ID No. 1197, Seq. ID No.  
1213, Seq. ID No. 1223, Seq. ID No. 1227, Seq. ID No. 1229, Seq. ID No. 1237, Seq. ID  
15 No. 1243, Seq. ID No. 1265, Seq. ID No. 1267, Seq. ID No. 1269, Seq. ID No. 1271,  
Seq. ID No. 1283, Seq. ID No. 1287, Seq. ID No. 1291, Seq. ID No. 1297, Seq. ID No.  
1305, Seq. ID No. 1315, Seq. ID No. 1325, Seq. ID No. 1327, Seq. ID No. 1329, Seq. ID  
No. 1331, Seq. ID No. 1341, Seq. ID No. 1353, Seq. ID No. 1367, Seq. ID No. 1401,  
Seq. ID No. 1429, Seq. ID No. 1435, Seq. ID No. 1445, Seq. ID No. 1481, Seq. ID No.  
20 1513, Seq. ID No. 1515, Seq. ID No. 1517, Seq. ID No. 1529, Seq. ID No. 1533, Seq. ID  
No. 1535, Seq. ID No. 1545, Seq. ID No. 1547, Seq. ID No. 1551, Seq. ID No. 1559,  
Seq. ID No. 1563, Seq. ID No. 1571, Seq. ID No. 1579, Seq. ID No. 1583, Seq. ID No.  
1585, Seq. ID No. 1621, Seq. ID No. 1633, Seq. ID No. 1643, Seq. ID No. 1645, Seq. ID  
No. 1647, Seq. ID No. 1649, Seq. ID No. 1653, Seq. ID No. 1671, Seq. ID No. 1673,  
25 Seq. ID No. 1677, Seq. ID No. 1681, Seq. ID No. 1707, Seq. ID No. 1731, Seq. ID No.  
1733, Seq. ID No. 1737, Seq. ID No. 1753, Seq. ID No. 1757, Seq. ID No. 1765, Seq. ID  
No. 1767, Seq. ID No. 1787, Seq. ID No. 1791, Seq. ID No. 1797, Seq. ID No. 1805,  
Seq. ID No. 1819, Seq. ID No. 1821, Seq. ID No. 1823, Seq. ID No. 1839, Seq. ID No.  
1869, Seq. ID No. 1875, Seq. ID No. 1891, Seq. ID No. 1893, Seq. ID No. 1895, Seq. ID  
30 No. 1923, Seq. ID No. 1927, Seq. ID No. 1969, Seq. ID No. 1981, Seq. ID No. 1991,  
Seq. ID No. 1993, Seq. ID No. 2013, Seq. ID No. 2017, Seq. ID No. 2027, Seq. ID No.  
2033, Seq. ID No. 2041, Seq. ID No. 2049, Seq. ID No. 2053, Seq. ID No. 2087, Seq. ID  
No. 2089, Seq. ID No. 2105, Seq. ID No. 2115, Seq. ID No. 2121, Seq. ID No. 2127,

Seq. ID No. 2151, Seq. ID No. 2159, Seq. ID No. 2171, Seq. ID No. 2173, Seq. ID No. 2177, Seq. ID No. 2187, Seq. ID No. 2237, Seq. ID No. 2239, Seq. ID No. 2245, Seq. ID No. 2249, Seq. ID No. 2271, Seq. ID No. 2283, Seq. ID No. 2289, Seq. ID No. 2291, Seq. ID No. 2293, Seq. ID No. 2295, Seq. ID No. 2303, Seq. ID No. 2305, Seq. ID No. 5 2307, Seq. ID No. 2317, Seq. ID No. 2319, Seq. ID No. 2321, Seq. ID No. 2323, Seq. ID No. 2325, Seq. ID No. 2327, Seq. ID No. 2333, Seq. ID No. 2343, Seq. ID No. 2347, Seq. ID No. 2349, Seq. ID No. 2351, Seq. ID No. 2353, Seq. ID No. 2355, Seq. ID No. 2357, Seq. ID No. 2365, Seq. ID No. 2389, Seq. ID No. 2391, Seq. ID No. 2407, Seq. ID No. 2419, Seq. ID No. 2421, Seq. ID No. 2427, Seq. ID No. 2429, Seq. ID No. 2433, 10 Seq. ID No. 2449, Seq. ID No. 2459, Seq. ID No. 2489, Seq. ID No. 2497, Seq. ID No. 2503, Seq. ID No. 2507, Seq. ID No. 2515, Seq. ID No. 2523, Seq. ID No. 2525, Seq. ID No. 2531, Seq. ID No. 2535, Seq. ID No. 2537, Seq. ID No. 2541, Seq. ID No. 2543, Seq. ID No. 2545, Seq. ID No. 2555, Seq. ID No. 2557, Seq. ID No. 2569, Seq. ID No. 2571, Seq. ID No. 2583, Seq. ID No. 2591, Seq. ID No. 2597, Seq. ID No. 2599, Seq. ID 15 No. 2601, Seq. ID No. 2607, Seq. ID No. 2611, Seq. ID No. 2621, Seq. ID No. 2629, Seq. ID No. 2651, Seq. ID No. 2679, Seq. ID No. 2693, Seq. ID No. 2701, Seq. ID No. 2703, Seq. ID No. 2705, Seq. ID No. 2707, Seq. ID No. 2731, Seq. ID No. 2733, Seq. ID No. 2783, Seq. ID No. 2785, Seq. ID No. 2813, Seq. ID No. 2815, Seq. ID No. 2823, Seq. ID No. 2835, Seq. ID No. 2837, Seq. ID No. 2841, Seq. ID No. 2853, Seq. ID No. 20 2873, Seq. ID No. 2875, Seq. ID No. 2881, Seq. ID No. 2905, Seq. ID No. 2935, Seq. ID No. 2937, Seq. ID No. 2939, Seq. ID No. 2941, Seq. ID No. 2947, Seq. ID No. 2949, Seq. ID No. 2969, Seq. ID No. 2973, Seq. ID No. 2977, Seq. ID No. 2981, Seq. ID No. 2987, Seq. ID No. 2991, Seq. ID No. 2995, Seq. ID No. 2997, Seq. ID No. 3005, Seq. ID No. 3007, Seq. ID No. 3013, Seq. ID No. 3023, Seq. ID No. 3025, Seq. ID No. 3027, 25 Seq. ID No. 3029, Seq. ID No. 3031, Seq. ID No. 3043, Seq. ID No. 3055, Seq. ID No. 3063, Seq. ID No. 3071, Seq. ID No. 3073, Seq. ID No. 3075, Seq. ID No. 3077, Seq. ID No. 3123, Seq. ID No. 3145, Seq. ID No. 3155, Seq. ID No. 3157, Seq. ID No. 3163, Seq. ID No. 3183, Seq. ID No. 3193, Seq. ID No. 3201, Seq. ID No. 3213, Seq. ID No. 3215, Seq. ID No. 3217, Seq. ID No. 3219, Seq. ID No. 3241, Seq. ID No. 3243, Seq. ID 30 No. 3245, Seq. ID No. 3249, Seq. ID No. 3257, Seq. ID No. 3261, Seq. ID No. 3269, Seq. ID No. 3275, Seq. ID No. 3297, Seq. ID No. 3317, Seq. ID No. 3323, Seq. ID No. 3337, Seq. ID No. 3339, Seq. ID No. 3349, Seq. ID No. 3351, Seq. ID No. 3353, Seq. ID No. 3357, Seq. ID No. 3359, Seq. ID No. 3377, Seq. ID No. 3389, Seq. ID No. 3391,

Seq. ID No. 3395, Seq. ID No. 3405, Seq. ID No. 3421, Seq. ID No. 3425, Seq. ID No. 3449, Seq. ID No. 3451, Seq. ID No. 3453, Seq. ID No. 3455, Seq. ID No. 3457, Seq. ID No. 3463, Seq. ID No. 3481, Seq. ID No. 3491, Seq. ID No. 3493, Seq. ID No. 3503, Seq. ID No. 3505, Seq. ID No. 3527, Seq. ID No. 3593, Seq. ID No. 3595, Seq. ID No. 3621, Seq. ID No. 3625, Seq. ID No. 3635, Seq. ID No. 3679, Seq. ID No. 3723, Seq. ID No. 3727, Seq. ID No. 3745, Seq. ID No. 3753, Seq. ID No. 3755, Seq. ID No. 3757, Seq. ID No. 3761, Seq. ID No. 3763, Seq. ID No. 3765, Seq. ID No. 3783, Seq. ID No. 3793, Seq. ID No. 3799, Seq. ID No. 3813, Seq. ID No. 3837, Seq. ID No. 3839, Seq. ID No. 3849, Seq. ID No. 3851, Seq. ID No. 3853, Seq. ID No. 3859, Seq. ID No. 3861, Seq. ID No. 3863, Seq. ID No. 3865, Seq. ID No. 3879, Seq. ID No. 3889, Seq. ID No. 3891, Seq. ID No. 3903, Seq. ID No. 3925, Seq. ID No. 3963, Seq. ID No. 3973, Seq. ID No. 3975, Seq. ID No. 4005, Seq. ID No. 4025, Seq. ID No. 4027, Seq. ID No. 4039, Seq. ID No. 4041, Seq. ID No. 4043, Seq. ID No. 4045, Seq. ID No. 4047, Seq. ID No. 4061, Seq. ID No. 4071, Seq. ID No. 4073, Seq. ID No. 4079, Seq. ID No. 4081, Seq. ID No. 4083, Seq. ID No. 4101, Seq. ID No. 4103, Seq. ID No. 4111, Seq. ID No. 4133, Seq. ID No. 4137, Seq. ID No. 4139, Seq. ID No. 4145, Seq. ID No. 4151, Seq. ID No. 4221, Seq. ID No. 4223, Seq. ID No. 4225, Seq. ID No. 4227, Seq. ID No. 4231, Seq. ID No. 4241, Seq. ID No. 4247, Seq. ID No. 4253, Seq. ID No. 4257, Seq. ID No. 4261, Seq. ID No. 4307, Seq. ID No. 4311, Seq. ID No. 4313, Seq. ID No. 4343, Seq. ID No. 4379, Seq. ID No. 4385, Seq. ID No. 4389, Seq. ID No. 4439, Seq. ID No. 4469, Seq. ID No. 4473, Seq. ID No. 4481, Seq. ID No. 4483, Seq. ID No. 4485, Seq. ID No. 4497, Seq. ID No. 4515, Seq. ID No. 4533, Seq. ID No. 4587, Seq. ID No. 4639, Seq. ID No. 4643, Seq. ID No. 4681, Seq. ID No. 4705, Seq. ID No. 4707, Seq. ID No. 4709, Seq. ID No. 4711, Seq. ID No. 4715, Seq. ID No. 4717, Seq. ID No. 4737, Seq. ID No. 4759, Seq. ID No. 4813, Seq. ID No. 4827, Seq. ID No. 4869, Seq. ID No. 4871, Seq. ID No. 4873, Seq. ID No. 4875, Seq. ID No. 4919, Seq. ID No. 4931, Seq. ID No. 4949, Seq. ID No. 4951, Seq. ID No. 4987, Seq. ID No. 5031, Seq. ID No. 5061, Seq. ID No. 5085, Seq. ID No. 5103, Seq. ID No. 5123, Seq. ID No. 5129, Seq. ID No. 5131, Seq. ID No. 5135, Seq. ID No. 5137, Seq. ID No. 5141, Seq. ID No. 5165, Seq. ID No. 5175, Seq. ID No. 5199, Seq. ID No. 5205, Seq. ID No. 5207, Seq. ID No. 5213, Seq. ID No. 5219, Seq. ID No. 5223, Seq. ID No. 5267, Seq. ID No. 5281, Seq. ID No. 5385, Seq. ID No. 5387, Seq. ID No. 5413, Seq. ID No. 5415, Seq. ID No. 5433, Seq. ID No. 5453, Seq. ID No. 5459, Seq. ID No. 5461, Seq. ID No. 5463, Seq. ID No. 5465, Seq. ID No. 5491,

Seq. ID No. 5497, Seq. ID No. 5509, Seq. ID No. 5513, Seq. ID No. 5525, Seq. ID No. 5531, Seq. ID No. 5569, Seq. ID No. 5587, Seq. ID No. 5595, Seq. ID No. 5597, Seq. ID No. 5609, Seq. ID No. 5611, Seq. ID No. 5621, Seq. ID No. 5623, Seq. ID No. 5633, Seq. ID No. 5637, Seq. ID No. 5643, Seq. ID No. 5649, Seq. ID No. 5659, Seq. ID No. 5683, Seq. ID No. 5685, Seq. ID No. 5699, Seq. ID No. 5705, Seq. ID No. 5709, Seq. ID No. 5729, Seq. ID No. 5733, Seq. ID No. 5763, Seq. ID No. 5765, Seq. ID No. 5767, Seq. ID No. 5771, Seq. ID No. 5783, Seq. ID No. 5791, Seq. ID No. 5797, Seq. ID No. 5885, Seq. ID No. 5889, Seq. ID No. 5893, Seq. ID No. 5895, Seq. ID No. 5899, Seq. ID No. 5901, Seq. ID No. 5905, Seq. ID No. 5909, Seq. ID No. 5921, Seq. ID No. 5923, Seq. ID No. 5927, Seq. ID No. 5939, Seq. ID No. 6027, Seq. ID No. 6043, Seq. ID No. 6047, Seq. ID No. 6059, Seq. ID No. 6067, Seq. ID No. 6089, Seq. ID No. 6091, Seq. ID No. 6107, Seq. ID No. 6111, Seq. ID No. 6117, Seq. ID No. 6161, Seq. ID No. 6163, Seq. ID No. 6165, Seq. ID No. 6169, Seq. ID No. 6183, Seq. ID No. 6185, Seq. ID No. 6189, Seq. ID No. 6191, Seq. ID No. 6197, Seq. ID No. 6203, Seq. ID No. 6205, Seq. ID No. 6209, Seq. ID No. 6221, Seq. ID No. 6223, Seq. ID No. 6225, Seq. ID No. 6227, Seq. ID No. 6229, Seq. ID No. 6235, Seq. ID No. 6237, Seq. ID No. 6243, Seq. ID No. 6245, Seq. ID No. 6249, Seq. ID No. 6253, Seq. ID No. 6263, Seq. ID No. 6265, Seq. ID No. 6273, Seq. ID No. 6275, Seq. ID No. 6285, Seq. ID No. 6289, Seq. ID No. 6301, Seq. ID No. 6303, Seq. ID No. 6363, Seq. ID No. 6377, Seq. ID No. 6381, Seq. ID No. 6383, Seq. ID No. 6415, Seq. ID No. 6427, Seq. ID No. 6431, Seq. ID No. 6473, Seq. ID No. 6497, Seq. ID No. 6571, Seq. ID No. 6581, Seq. ID No. 6593, Seq. ID No. 6599, Seq. ID No. 6631, and Seq. ID No. 6639.

In one preferred embodiment, the invention comprises an isolated polynucleotide of an *Alloiococcus otitidis* genomic sequence, wherein the polynucleotide comprises a nucleotide sequence having at least about 70% identity to a nucleotide sequence contained within SEQ ID NO: 6651, a complement thereof, a degenerate variant thereof, and a fragment thereof.

In other preferred embodiments, the invention comprises an isolated polypeptide encoded by a polynucleotide and having at least about 70% identity to a nucleotide sequence chosen from one of the odd numbered sequence listings set out in SEQ ID NO: 1 through SEQ ID NO: 6649.

In certain aspects, the invention relates to *Alloiococcus otitidis* polypeptides. More particularly, the invention relates to *Alloiococcus otitidis* polypeptides, more preferably

antigenic polypeptides, encoded by *Alloicoccus otitidis* polynucleotide open reading frames. Thus, in certain embodiments, an isolated polypeptide is encoded by a polynucleotide comprising a nucleotide sequence having at least about 70% identity to a nucleotide sequence chosen from one of odd numbered sequences set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a complement thereof, a degenerate variant thereof, or a fragment thereof. In a preferred embodiment, the isolated polypeptide encoded by one of the above polynucleotides comprises an amino acid sequence having at least about 70% identity to an amino acid sequence chosen from one of the even numbered sequences set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof. In other embodiments, the polypeptide is a fusion polypeptide. In a preferred embodiment, the polypeptide immunoreacts with seropositive serum of an individual previously infected with *Alloicoccus otitidis*, a biological equivalent thereof, or a fragment thereof.

In other preferred embodiments, the isolated polypeptide encoded is selected from (a) an *Alloicoccus otitidis* polypeptide predicted by SignalP algorithm analysis as having met all four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and a subset of these are predicted by HMM SignalP algorithm analysis as having a signal peptide; (b) an *Alloicoccus otitidis* polypeptide predicted by SignalP algorithm analysis as having met three of the four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and a subset of these predicted by HMM SignalP algorithm analysis as having a signal peptide; (c) an *Alloicoccus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as having a signal peptide; (d) an *Alloicoccus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as being a non-secretory protein; (e) an *Alloicoccus otitidis* polypeptide identified by Pfam analysis; (f) an *Alloicoccus otitidis* polypeptide identified by BlastP analysis; (g) an *Alloicoccus otitidis* polypeptide identified using proteomics methodology as sharing homology with surface exposed proteins of *Streptococcus pneumoniae*; (h) an *Alloicoccus otitidis* polypeptide having a LPXTG motif, wherein the polypeptide is covalently attached to the peptidoglycan layer; (i) an *Alloicoccus otitidis* lipoprotein; (j) an *Alloicoccus otitidis* polypeptide non-covalently associated with the peptidoglycan layer; (k) an *Alloicoccus otitidis* polypeptide having an RGD motif wherein X is not a proline residue; (l) an *Alloicoccus otitidis* polypeptide predicted by BlastP as being involved in capsule biosynthesis and transport; (m) an *Alloicoccus otitidis* polypeptide

identified by BlastP as being localized within the capsule loci of the *Alloiococcus otitidis* genome; (n) an *Alloiococcus otitidis* polypeptide predicted by BlastP as being associated with sporulation; (o) an *Alloiococcus otitidis* polypeptide encoded by unique ORFs identified by BlastP analysis as having a BlastP 'E Value' of  $> e^{-10}$ ; (p) an *Alloiococcus*  
 5 *otitidis* polypeptide identified by Glimmer™ ORF finder program; (q) an *Alloiococcus*  
*otitidis* polypeptide identified by GeneMark™ ORF finder program; (r) an *Alloiococcus*  
*otitidis* polypeptide identified by Applicants' assignee's ORF finder program that  
 searches for an ATG, GTG or TTG Start codon between a Stop-Stop region; and (s) an  
*Alloiococcus otitidis* polypeptide identified by Applicants' assignee's ORF finder program  
 10 that searches for a transmembrane domain between two Stop codons and a Start codon  
 immediately upstream of this transmembrane region.

In a preferred embodiment, the polypeptide is selected from the *Alloiococcus*  
*otitidis* polypeptides predicted by SignalP algorithm analysis as having met all four  
 criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and is  
 15 selected from one of Seq. ID No. 90, Seq. ID No. 128, Seq. ID No. 132, Seq. ID No. 134,  
 Seq. ID No. 162, Seq. ID No. 164, Seq. ID No. 214, Seq. ID No. 216, Seq. ID No. 226,  
 Seq. ID No. 250, Seq. ID No. 252, Seq. ID No. 288, Seq. ID No. 290, Seq. ID No. 370,  
 Seq. ID No. 372, Seq. ID No. 376, Seq. ID No. 378, Seq. ID No. 498, Seq. ID No. 504,  
 Seq. ID No. 506, Seq. ID No. 528, Seq. ID No. 550, Seq. ID No. 576, Seq. ID No. 618,  
 20 Seq. ID No. 658, Seq. ID No. 660, Seq. ID No. 662, Seq. ID No. 676, Seq. ID No. 716,  
 Seq. ID No. 718, Seq. ID No. 746, Seq. ID No. 748, Seq. ID No. 756, Seq. ID No. 758,  
 Seq. ID No. 760, Seq. ID No. 762, Seq. ID No. 774, Seq. ID No. 808, Seq. ID No. 968,  
 Seq. ID No. 974, Seq. ID No. 976, Seq. ID No. 1014, Seq. ID No. 1026, Seq. ID No.  
 1028, Seq. ID No. 1040, Seq. ID No. 1076, Seq. ID No. 1090, Seq. ID No. 1196, Seq. ID  
 25 No. 1198, Seq. ID No. 1208, Seq. ID No. 1240, Seq. ID No. 1244, Seq. ID No. 1246,  
 Seq. ID No. 1270, Seq. ID No. 1316, Seq. ID No. 1318, Seq. ID No. 1332, Seq. ID No.  
 1366, Seq. ID No. 1368, Seq. ID No. 1370, Seq. ID No. 1446, Seq. ID No. 1448, Seq. ID  
 No. 1514, Seq. ID No. 1518, Seq. ID No. 1546, Seq. ID No. 1550, Seq. ID No. 1562,  
 Seq. ID No. 1570, Seq. ID No. 1572, Seq. ID No. 1586, Seq. ID No. 1644, Seq. ID No.  
 30 1654, Seq. ID No. 1662, Seq. ID No. 1664, Seq. ID No. 1708, Seq. ID No. 1734, Seq. ID  
 No. 1738, Seq. ID No. 1756, Seq. ID No. 1766, Seq. ID No. 1768, Seq. ID No. 1776,  
 Seq. ID No. 1792, Seq. ID No. 1806, Seq. ID No. 1876, Seq. ID No. 1970, Seq. ID No.  
 1982, Seq. ID No. 2054, Seq. ID No. 2056, Seq. ID No. 2088, Seq. ID No. 2090, Seq. ID

No. 2092, Seq. ID No. 2106, Seq. ID No. 2116, Seq. ID No. 2150, Seq. ID No. 2152, Seq. ID No. 2160, Seq. ID No. 2178, Seq. ID No. 2278, Seq. ID No. 2294, Seq. ID No. 2322, Seq. ID No. 2348, Seq. ID No. 2352, Seq. ID No. 2354, Seq. ID No. 2366, Seq. ID No. 2396, Seq. ID No. 2422, Seq. ID No. 2426, Seq. ID No. 2428, Seq. ID No. 2430, Seq. ID No. 2450, Seq. ID No. 2460, Seq. ID No. 2526, Seq. ID No. 2532, Seq. ID No. 2608, Seq. ID No. 2652, Seq. ID No. 2680, Seq. ID No. 2694, Seq. ID No. 2700, Seq. ID No. 2704, Seq. ID No. 2754, Seq. ID No. 2786, Seq. ID No. 2814, Seq. ID No. 2830, Seq. ID No. 2836, Seq. ID No. 2842, Seq. ID No. 2880, Seq. ID No. 2882, Seq. ID No. 2936, Seq. ID No. 2938, Seq. ID No. 2950, Seq. ID No. 2966, Seq. ID No. 2968, Seq. ID No. 2974, Seq. ID No. 3008, Seq. ID No. 3010, Seq. ID No. 3012, Seq. ID No. 3030, Seq. ID No. 3032, Seq. ID No. 3110, Seq. ID No. 3112, Seq. ID No. 3220, Seq. ID No. 3224, Seq. ID No. 3274, Seq. ID No. 3298, Seq. ID No. 3332, Seq. ID No. 3336, Seq. ID No. 3342, Seq. ID No. 3350, Seq. ID No. 3354, Seq. ID No. 3356, Seq. ID No. 3378, Seq. ID No. 3392, Seq. ID No. 3426, Seq. ID No. 3450, Seq. ID No. 3494, Seq. ID No. 3574, Seq. ID No. 3612, Seq. ID No. 3620, Seq. ID No. 3690, Seq. ID No. 3754, Seq. ID No. 3756, Seq. ID No. 3766, Seq. ID No. 3782, Seq. ID No. 3784, Seq. ID No. 3852, Seq. ID No. 3904, Seq. ID No. 4006, Seq. ID No. 4008, Seq. ID No. 4028, Seq. ID No. 4074, Seq. ID No. 4138, Seq. ID No. 4142, Seq. ID No. 4144, Seq. ID No. 4146, Seq. ID No. 4226, Seq. ID No. 4344, Seq. ID No. 4386, Seq. ID No. 4400, Seq. ID No. 4470, Seq. ID No. 4484, Seq. ID No. 4494, Seq. ID No. 4496, Seq. ID No. 4534, Seq. ID No. 4700, Seq. ID No. 4710, Seq. ID No. 4712, Seq. ID No. 4736, Seq. ID No. 4828, Seq. ID No. 4872, Seq. ID No. 4874, Seq. ID No. 4880, Seq. ID No. 4922, Seq. ID No. 4982, Seq. ID No. 5116, Seq. ID No. 5268, Seq. ID No. 5342, Seq. ID No. 5388, Seq. ID No. 5466, Seq. ID No. 5468, Seq. ID No. 5480, Seq. ID No. 5498, Seq. ID No. 5514, Seq. ID No. 5544, Seq. ID No. 5546, Seq. ID No. 5568, Seq. ID No. 5588, Seq. ID No. 5590, Seq. ID No. 5592, Seq. ID No. 5612, Seq. ID No. 5622, Seq. ID No. 5642, Seq. ID No. 5682, Seq. ID No. 5720, Seq. ID No. 5772, Seq. ID No. 5784, Seq. ID No. 5896, Seq. ID No. 5900, Seq. ID No. 5902, Seq. ID No. 5928, Seq. ID No. 5930, Seq. ID No. 5940, Seq. ID No. 5988, Seq. ID No. 6014, Seq. ID No. 6088, Seq. ID No. 6090, Seq. ID No. 6092, Seq. ID No. 6094, Seq. ID No. 6096, Seq. ID No. 6104, Seq. ID No. 6170, Seq. ID No. 6186, Seq. ID No. 6188, Seq. ID No. 6196, Seq. ID No. 6198, Seq. ID No. 6204, Seq. ID No. 6206, Seq. ID No. 6222, Seq. ID No. 6224, Seq. ID No. 6230, Seq. ID No. 6292, Seq. ID No. 6416, Seq. ID No. 6418, Seq. ID No. 6474, Seq. ID No. 6508, Seq. ID



No. 6544, Seq. ID No. 6596, Seq. ID No. 6598, Seq. ID No. 6600, Seq. ID No. 6602, and Seq. ID No. 6604.

In another preferred embodiment, the polypeptide is selected from *Alloiooccus otitidis* polypeptides predicted by SignalP algorithm analysis as having met three of the  
5 four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and predicted by HMM SignalP algorithm analysis as having a signal peptide and is selected from one of Seq. ID No. 8, Seq. ID No. 12, Seq. ID No. 24, Seq. ID No. 46, Seq. ID No. 48, Seq. ID No. 54, Seq. ID No. 60, Seq. ID No. 66, Seq. ID No. 68, Seq. ID No. 88, Seq. ID No. 92, Seq. ID No. 140, Seq. ID No. 152, Seq. ID No. 160, Seq. ID No. 166, Seq. ID  
10 No. 170, Seq. ID No. 186, Seq. ID No. 212, Seq. ID No. 218, Seq. ID No. 236, Seq. ID No. 238, Seq. ID No. 240, Seq. ID No. 272, Seq. ID No. 286, Seq. ID No. 292, Seq. ID No. 328, Seq. ID No. 350, Seq. ID No. 386, Seq. ID No. 388, Seq. ID No. 408, Seq. ID No. 428, Seq. ID No. 432, Seq. ID No. 456, Seq. ID No. 458, Seq. ID No. 496, Seq. ID No. 500, Seq. ID No. 512, Seq. ID No. 514, Seq. ID No. 516, Seq. ID No. 526, Seq. ID  
15 No. 546, Seq. ID No. 548, Seq. ID No. 558, Seq. ID No. 570, Seq. ID No. 590, Seq. ID No. 592, Seq. ID No. 594, Seq. ID No. 596, Seq. ID No. 610, Seq. ID No. 638, Seq. ID No. 640, Seq. ID No. 642, Seq. ID No. 654, Seq. ID No. 670, Seq. ID No. 680, Seq. ID No. 720, Seq. ID No. 724, Seq. ID No. 740, Seq. ID No. 750, Seq. ID No. 752, Seq. ID No. 764, Seq. ID No. 766, Seq. ID No. 770, Seq. ID No. 778, Seq. ID No. 780, Seq. ID  
20 No. 782, Seq. ID No. 820, Seq. ID No. 896, Seq. ID No. 904, Seq. ID No. 906, Seq. ID No. 910, Seq. ID No. 936, Seq. ID No. 938, Seq. ID No. 952, Seq. ID No. 956, Seq. ID No. 980, Seq. ID No. 982, Seq. ID No. 984, Seq. ID No. 986, Seq. ID No. 1006, Seq. ID No. 1008, Seq. ID No. 1010, Seq. ID No. 1016, Seq. ID No. 1020, Seq. ID No. 1030, Seq. ID No. 1032, Seq. ID No. 1048, Seq. ID No. 1092, Seq. ID No. 1112, Seq. ID No.  
25 1138, Seq. ID No. 1152, Seq. ID No. 1154, Seq. ID No. 1170, Seq. ID No. 1174, Seq. ID No. 1184, Seq. ID No. 1192, Seq. ID No. 1194, Seq. ID No. 1214, Seq. ID No. 1224, Seq. ID No. 1230, Seq. ID No. 1248, Seq. ID No. 1260, Seq. ID No. 1284, Seq. ID No. 1308, Seq. ID No. 1320, Seq. ID No. 1322, Seq. ID No. 1328, Seq. ID No. 1342, Seq. ID No. 1344, Seq. ID No. 1348, Seq. ID No. 1390, Seq. ID No. 1402, Seq. ID No. 1430,  
30 Seq. ID No. 1480, Seq. ID No. 1552, Seq. ID No. 1560, Seq. ID No. 1580, Seq. ID No. 1588, Seq. ID No. 1622, Seq. ID No. 1628, Seq. ID No. 1634, Seq. ID No. 1646, Seq. ID No. 1648, Seq. ID No. 1650, Seq. ID No. 1656, Seq. ID No. 1666, Seq. ID No. 1668, Seq. ID No. 1672, Seq. ID No. 1678, Seq. ID No. 1680, Seq. ID No. 1682, Seq. ID No.

1696, Seq. ID No. 1704, Seq. ID No. 1706, Seq. ID No. 1732, Seq. ID No. 1754, Seq. ID  
No. 1760, Seq. ID No. 1764, Seq. ID No. 1788, Seq. ID No. 1798, Seq. ID No. 1822,  
Seq. ID No. 1824, Seq. ID No. 1834, Seq. ID No. 1840, Seq. ID No. 1842, Seq. ID No.  
1844, Seq. ID No. 1894, Seq. ID No. 1918, Seq. ID No. 1920, Seq. ID No. 1972, Seq. ID  
5 No. 1992, Seq. ID No. 2014, Seq. ID No. 2016, Seq. ID No. 2018, Seq. ID No. 2020,  
Seq. ID No. 2034, Seq. ID No. 2036, Seq. ID No. 2050, Seq. ID No. 2082, Seq. ID No.  
2084, Seq. ID No. 2086, Seq. ID No. 2112, Seq. ID No. 2114, Seq. ID No. 2124, Seq. ID  
No. 2126, Seq. ID No. 2128, Seq. ID No. 2132, Seq. ID No. 2134, Seq. ID No. 2154,  
Seq. ID No. 2162, Seq. ID No. 2172, Seq. ID No. 2176, Seq. ID No. 2180, Seq. ID No.  
10 2188, Seq. ID No. 2202, Seq. ID No. 2204, Seq. ID No. 2222, Seq. ID No. 2238, Seq. ID  
No. 2250, Seq. ID No. 2252, Seq. ID No. 2256, Seq. ID No. 2262, Seq. ID No. 2264,  
Seq. ID No. 2272, Seq. ID No. 2280, Seq. ID No. 2284, Seq. ID No. 2286, Seq. ID No.  
2290, Seq. ID No. 2296, Seq. ID No. 2306, Seq. ID No. 2308, Seq. ID No. 2318, Seq. ID  
No. 2320, Seq. ID No. 2324, Seq. ID No. 2326, Seq. ID No. 2344, Seq. ID No. 2350,  
15 Seq. ID No. 2386, Seq. ID No. 2394, Seq. ID No. 2424, Seq. ID No. 2454, Seq. ID No.  
2492, Seq. ID No. 2498, Seq. ID No. 2500, Seq. ID No. 2508, Seq. ID No. 2516, Seq. ID  
No. 2518, Seq. ID No. 2522, Seq. ID No. 2524, Seq. ID No. 2528, Seq. ID No. 2534,  
Seq. ID No. 2536, Seq. ID No. 2542, Seq. ID No. 2544, Seq. ID No. 2548, Seq. ID No.  
2550, Seq. ID No. 2558, Seq. ID No. 2574, Seq. ID No. 2584, Seq. ID No. 2602, Seq. ID  
20 No. 2604, Seq. ID No. 2622, Seq. ID No. 2654, Seq. ID No. 2682, Seq. ID No. 2692,  
Seq. ID No. 2702, Seq. ID No. 2734, Seq. ID No. 2740, Seq. ID No. 2802, Seq. ID No.  
2808, Seq. ID No. 2816, Seq. ID No. 2820, Seq. ID No. 2822, Seq. ID No. 2824, Seq. ID  
No. 2834, Seq. ID No. 2838, Seq. ID No. 2840, Seq. ID No. 2846, Seq. ID No. 2854,  
Seq. ID No. 2862, Seq. ID No. 2866, Seq. ID No. 2874, Seq. ID No. 2876, Seq. ID No.  
25 2878, Seq. ID No. 2884, Seq. ID No. 2896, Seq. ID No. 2906, Seq. ID No. 2940, Seq. ID  
No. 2942, Seq. ID No. 2948, Seq. ID No. 2982, Seq. ID No. 2984, Seq. ID No. 2988,  
Seq. ID No. 2992, Seq. ID No. 2996, Seq. ID No. 3002, Seq. ID No. 3006, Seq. ID No.  
3022, Seq. ID No. 3026, Seq. ID No. 3044, Seq. ID No. 3046, Seq. ID No. 3074, Seq. ID  
No. 3076, Seq. ID No. 3156, Seq. ID No. 3164, Seq. ID No. 3166, Seq. ID No. 3168,  
30 Seq. ID No. 3184, Seq. ID No. 3214, Seq. ID No. 3216, Seq. ID No. 3236, Seq. ID No.  
3246, Seq. ID No. 3262, Seq. ID No. 3264, Seq. ID No. 3266, Seq. ID No. 3270, Seq. ID  
No. 3272, Seq. ID No. 3276, Seq. ID No. 3278, Seq. ID No. 3318, Seq. ID No. 3326,  
Seq. ID No. 3338, Seq. ID No. 3352, Seq. ID No. 3390, Seq. ID No. 3406, Seq. ID No.

3420, Seq. ID No. 3422, Seq. ID No. 3424, Seq. ID No. 3452, Seq. ID No. 3454, Seq. ID  
No. 3456, Seq. ID No. 3492, Seq. ID No. 3496, Seq. ID No. 3504, Seq. ID No. 3506,  
Seq. ID No. 3518, Seq. ID No. 3520, Seq. ID No. 3546, Seq. ID No. 3548, Seq. ID No.  
3572, Seq. ID No. 3594, Seq. ID No. 3618, Seq. ID No. 3622, Seq. ID No. 3630, Seq. ID  
5 No. 3664, Seq. ID No. 3702, Seq. ID No. 3704, Seq. ID No. 3724, Seq. ID No. 3738,  
Seq. ID No. 3742, Seq. ID No. 3746, Seq. ID No. 3748, Seq. ID No. 3760, Seq. ID No.  
3764, Seq. ID No. 3768, Seq. ID No. 3770, Seq. ID No. 3772, Seq. ID No. 3786, Seq. ID  
No. 3794, Seq. ID No. 3814, Seq. ID No. 3838, Seq. ID No. 3840, Seq. ID No. 3862,  
Seq. ID No. 3866, Seq. ID No. 3890, Seq. ID No. 3892, Seq. ID No. 3896, Seq. ID No.  
10 3916, Seq. ID No. 3924, Seq. ID No. 3926, Seq. ID No. 3930, Seq. ID No. 3966, Seq. ID  
No. 3976, Seq. ID No. 3980, Seq. ID No. 3996, Seq. ID No. 3998, Seq. ID No. 4010,  
Seq. ID No. 4040, Seq. ID No. 4042, Seq. ID No. 4062, Seq. ID No. 4080, Seq. ID No.  
4082, Seq. ID No. 4112, Seq. ID No. 4114, Seq. ID No. 4136, Seq. ID No. 4140, Seq. ID  
No. 4156, Seq. ID No. 4182, Seq. ID No. 4204, Seq. ID No. 4222, Seq. ID No. 4248,  
15 Seq. ID No. 4254, Seq. ID No. 4258, Seq. ID No. 4260, Seq. ID No. 4262, Seq. ID No.  
4264, Seq. ID No. 4270, Seq. ID No. 4312, Seq. ID No. 4380, Seq. ID No. 4390, Seq. ID  
No. 4392, Seq. ID No. 4472, Seq. ID No. 4474, Seq. ID No. 4482, Seq. ID No. 4526,  
Seq. ID No. 4552, Seq. ID No. 4562, Seq. ID No. 4574, Seq. ID No. 4618, Seq. ID No.  
4640, Seq. ID No. 4660, Seq. ID No. 4682, Seq. ID No. 4702, Seq. ID No. 4706, Seq. ID  
20 No. 4714, Seq. ID No. 4718, Seq. ID No. 4722, Seq. ID No. 4738, Seq. ID No. 4742,  
Seq. ID No. 4814, Seq. ID No. 4818, Seq. ID No. 4820, Seq. ID No. 4830, Seq. ID No.  
4832, Seq. ID No. 4852, Seq. ID No. 4870, Seq. ID No. 4876, Seq. ID No. 4914, Seq. ID  
No. 4920, Seq. ID No. 4930, Seq. ID No. 4932, Seq. ID No. 4984, Seq. ID No. 4994,  
Seq. ID No. 5012, Seq. ID No. 5024, Seq. ID No. 5032, Seq. ID No. 5034, Seq. ID No.  
25 5036, Seq. ID No. 5044, Seq. ID No. 5062, Seq. ID No. 5064, Seq. ID No. 5070, Seq. ID  
No. 5104, Seq. ID No. 5122, Seq. ID No. 5124, Seq. ID No. 5132, Seq. ID No. 5134,  
Seq. ID No. 5136, Seq. ID No. 5138, Seq. ID No. 5140, Seq. ID No. 5142, Seq. ID No.  
5152, Seq. ID No. 5160, Seq. ID No. 5162, Seq. ID No. 5166, Seq. ID No. 5168, Seq. ID  
No. 5176, Seq. ID No. 5178, Seq. ID No. 5206, Seq. ID No. 5208, Seq. ID No. 5212,  
30 Seq. ID No. 5216, Seq. ID No. 5220, Seq. ID No. 5224, Seq. ID No. 5286, Seq. ID No.  
5288, Seq. ID No. 5330, Seq. ID No. 5332, Seq. ID No. 5378, Seq. ID No. 5380, Seq. ID  
No. 5382, Seq. ID No. 5386, Seq. ID No. 5406, Seq. ID No. 5408, Seq. ID No. 5454,  
Seq. ID No. 5460, Seq. ID No. 5462, Seq. ID No. 5464, Seq. ID No. 5482, Seq. ID No.

5510, Seq. ID No. 5530, Seq. ID No. 5532, Seq. ID No. 5558, Seq. ID No. 5570, Seq. ID No. 5578, Seq. ID No. 5624, Seq. ID No. 5626, Seq. ID No. 5644, Seq. ID No. 5660, Seq. ID No. 5662, Seq. ID No. 5684, Seq. ID No. 5686, Seq. ID No. 5710, Seq. ID No. 5712, Seq. ID No. 5734, Seq. ID No. 5740, Seq. ID No. 5766, Seq. ID No. 5798, Seq. ID No. 5828, Seq. ID No. 5890, Seq. ID No. 5894, Seq. ID No. 5906, Seq. ID No. 5910, Seq. ID No. 5912, Seq. ID No. 5924, Seq. ID No. 5964, Seq. ID No. 5966, Seq. ID No. 6026, Seq. ID No. 6028, Seq. ID No. 6032, Seq. ID No. 6044, Seq. ID No. 6046, Seq. ID No. 6048, Seq. ID No. 6054, Seq. ID No. 6060, Seq. ID No. 6110, Seq. ID No. 6112, Seq. ID No. 6116, Seq. ID No. 6118, Seq. ID No. 6128, Seq. ID No. 6132, Seq. ID No. 6136, Seq. ID No. 6138, Seq. ID No. 6162, Seq. ID No. 6166, Seq. ID No. 6184, Seq. ID No. 6190, Seq. ID No. 6192, Seq. ID No. 6194, Seq. ID No. 6208, Seq. ID No. 6210, Seq. ID No. 6218, Seq. ID No. 6226, Seq. ID No. 6236, Seq. ID No. 6244, Seq. ID No. 6250, Seq. ID No. 6254, Seq. ID No. 6260, Seq. ID No. 6266, Seq. ID No. 6268, Seq. ID No. 6276, Seq. ID No. 6284, Seq. ID No. 6286, Seq. ID No. 6304, Seq. ID No. 6326, Seq. ID No. 6328, Seq. ID No. 6364, Seq. ID No. 6366, Seq. ID No. 6368, Seq. ID No. 6386, Seq. ID No. 6426, Seq. ID No. 6428, Seq. ID No. 6430, Seq. ID No. 6432, Seq. ID No. 6454, Seq. ID No. 6466, Seq. ID No. 6470, Seq. ID No. 6472, Seq. ID No. 6480, Seq. ID No. 6540, Seq. ID No. 6542, Seq. ID No. 6572, Seq. ID No. 6574, Seq. ID No. 6640, Seq. ID No. 6644, and Seq. ID No. 6646.

In yet another preferred embodiment, the polypeptide is selected from the *Alloiococcus otitidis* polypeptides, which are predicted by HMM SignalP algorithm analysis as having a signal peptide and is selected from one of Seq. ID No. 4, Seq. ID No. 8, Seq. ID No. 10, Seq. ID No. 20, Seq. ID No. 22, Seq. ID No. 32, Seq. ID No. 34, Seq. ID No. 46, Seq. ID No. 48, Seq. ID No. 50, Seq. ID No. 54, Seq. ID No. 66, Seq. ID No. 68, Seq. ID No. 86, Seq. ID No. 88, Seq. ID No. 106, Seq. ID No. 112, Seq. ID No. 124, Seq. ID No. 132, Seq. ID No. 134, Seq. ID No. 142, Seq. ID No. 160, Seq. ID No. 162, Seq. ID No. 164, Seq. ID No. 172, Seq. ID No. 192, Seq. ID No. 210, Seq. ID No. 212, Seq. ID No. 214, Seq. ID No. 216, Seq. ID No. 218, Seq. ID No. 226, Seq. ID No. 236, Seq. ID No. 238, Seq. ID No. 250, Seq. ID No. 252, Seq. ID No. 256, Seq. ID No. 258, Seq. ID No. 260, Seq. ID No. 272, Seq. ID No. 274, Seq. ID No. 278, Seq. ID No. 286, Seq. ID No. 288, Seq. ID No. 290, Seq. ID No. 328, Seq. ID No. 330, Seq. ID No. 358, Seq. ID No. 360, Seq. ID No. 374, Seq. ID No. 376, Seq. ID No. 394, Seq. ID No. 402, Seq. ID No. 404, Seq. ID No. 456, Seq. ID No. 458, Seq. ID No. 478, Seq. ID No.

488, Seq. ID No. 490, Seq. ID No. 492, Seq. ID No. 494, Seq. ID No. 496, Seq. ID No.  
498, Seq. ID No. 500, Seq. ID No. 504, Seq. ID No. 506, Seq. ID No. 510, Seq. ID No.  
512, Seq. ID No. 514, Seq. ID No. 516, Seq. ID No. 526, Seq. ID No. 528, Seq. ID No.  
546, Seq. ID No. 548, Seq. ID No. 550, Seq. ID No. 558, Seq. ID No. 568, Seq. ID No.  
5 570, Seq. ID No. 576, Seq. ID No. 578, Seq. ID No. 580, Seq. ID No. 592, Seq. ID No.  
594, Seq. ID No. 600, Seq. ID No. 618, Seq. ID No. 638, Seq. ID No. 640, Seq. ID No.  
642, Seq. ID No. 644, Seq. ID No. 646, Seq. ID No. 648, Seq. ID No. 654, Seq. ID No.  
656, Seq. ID No. 658, Seq. ID No. 660, Seq. ID No. 662, Seq. ID No. 668, Seq. ID No.  
670, Seq. ID No. 676, Seq. ID No. 678, Seq. ID No. 680, Seq. ID No. 716, Seq. ID No.  
10 718, Seq. ID No. 720, Seq. ID No. 722, Seq. ID No. 724, Seq. ID No. 726, Seq. ID No.  
746, Seq. ID No. 748, Seq. ID No. 750, Seq. ID No. 752, Seq. ID No. 756, Seq. ID No.  
758, Seq. ID No. 760, Seq. ID No. 762, Seq. ID No. 764, Seq. ID No. 766, Seq. ID No.  
770, Seq. ID No. 778, Seq. ID No. 780, Seq. ID No. 782, Seq. ID No. 808, Seq. ID No.  
810, Seq. ID No. 820, Seq. ID No. 826, Seq. ID No. 864, Seq. ID No. 894, Seq. ID No.  
15 902, Seq. ID No. 936, Seq. ID No. 938, Seq. ID No. 942, Seq. ID No. 944, Seq. ID No.  
956, Seq. ID No. 958, Seq. ID No. 968, Seq. ID No. 980, Seq. ID No. 982, Seq. ID No.  
984, Seq. ID No. 986, Seq. ID No. 1002, Seq. ID No. 1004, Seq. ID No. 1006, Seq. ID  
No. 1008, Seq. ID No. 1010, Seq. ID No. 1012, Seq. ID No. 1014, Seq. ID No. 1016,  
Seq. ID No. 1020, Seq. ID No. 1030, Seq. ID No. 1032, Seq. ID No. 1034, Seq. ID No.  
20 1036, Seq. ID No. 1038, Seq. ID No. 1040, Seq. ID No. 1046, Seq. ID No. 1056, Seq. ID  
No. 1076, Seq. ID No. 1078, Seq. ID No. 1106, Seq. ID No. 1108, Seq. ID No. 1132,  
Seq. ID No. 1136, Seq. ID No. 1138, Seq. ID No. 1140, Seq. ID No. 1152, Seq. ID No.  
1166, Seq. ID No. 1168, Seq. ID No. 1170, Seq. ID No. 1174, Seq. ID No. 1184, Seq. ID  
No. 1196, Seq. ID No. 1198, Seq. ID No. 1204, Seq. ID No. 1214, Seq. ID No. 1224,  
25 Seq. ID No. 1228, Seq. ID No. 1230, Seq. ID No. 1238, Seq. ID No. 1244, Seq. ID No.  
1246, Seq. ID No. 1260, Seq. ID No. 1266, Seq. ID No. 1268, Seq. ID No. 1270, Seq. ID  
No. 1272, Seq. ID No. 1284, Seq. ID No. 1288, Seq. ID No. 1290, Seq. ID No. 1292,  
Seq. ID No. 1296, Seq. ID No. 1298, Seq. ID No. 1304, Seq. ID No. 1306, Seq. ID No.  
1316, Seq. ID No. 1318, Seq. ID No. 1320, Seq. ID No. 1326, Seq. ID No. 1328, Seq. ID  
30 No. 1330, Seq. ID No. 1332, Seq. ID No. 1338, Seq. ID No. 1342, Seq. ID No. 1344,  
Seq. ID No. 1348, Seq. ID No. 1350, Seq. ID No. 1352, Seq. ID No. 1354, Seq. ID No.  
1366, Seq. ID No. 1368, Seq. ID No. 1370, Seq. ID No. 1372, Seq. ID No. 1382, Seq. ID  
No. 1402, Seq. ID No. 1430, Seq. ID No. 1436, Seq. ID No. 1446, Seq. ID No. 1448,

Seq. ID No. 1482, Seq. ID No. 1514, Seq. ID No. 1516, Seq. ID No. 1518, Seq. ID No. 1530, Seq. ID No. 1534, Seq. ID No. 1536, Seq. ID No. 1546, Seq. ID No. 1548, Seq. ID No. 1552, Seq. ID No. 1554, Seq. ID No. 1560, Seq. ID No. 1562, Seq. ID No. 1564, Seq. ID No. 1572, Seq. ID No. 1580, Seq. ID No. 1584, Seq. ID No. 1586, Seq. ID No. 1622, Seq. ID No. 1634, Seq. ID No. 1640, Seq. ID No. 1644, Seq. ID No. 1646, Seq. ID No. 1648, Seq. ID No. 1650, Seq. ID No. 1654, Seq. ID No. 1662, Seq. ID No. 1664, Seq. ID No. 1666, Seq. ID No. 1672, Seq. ID No. 1674, Seq. ID No. 1678, Seq. ID No. 1680, Seq. ID No. 1682, Seq. ID No. 1694, Seq. ID No. 1708, Seq. ID No. 1712, Seq. ID No. 1732, Seq. ID No. 1734, Seq. ID No. 1738, Seq. ID No. 1754, Seq. ID No. 1756, Seq. ID No. 1758, Seq. ID No. 1766, Seq. ID No. 1768, Seq. ID No. 1772, Seq. ID No. 1782, Seq. ID No. 1788, Seq. ID No. 1792, Seq. ID No. 1798, Seq. ID No. 1806, Seq. ID No. 1820, Seq. ID No. 1822, Seq. ID No. 1824, Seq. ID No. 1840, Seq. ID No. 1858, Seq. ID No. 1870, Seq. ID No. 1876, Seq. ID No. 1892, Seq. ID No. 1894, Seq. ID No. 1896, Seq. ID No. 1916, Seq. ID No. 1918, Seq. ID No. 1920, Seq. ID No. 1924, Seq. ID No. 1928, Seq. ID No. 1930, Seq. ID No. 1970, Seq. ID No. 1982, Seq. ID No. 1992, Seq. ID No. 1994, Seq. ID No. 2006, Seq. ID No. 2014, Seq. ID No. 2018, Seq. ID No. 2020, Seq. ID No. 2026, Seq. ID No. 2028, Seq. ID No. 2034, Seq. ID No. 2036, Seq. ID No. 2042, Seq. ID No. 2050, Seq. ID No. 2054, Seq. ID No. 2056, Seq. ID No. 2088, Seq. ID No. 2090, Seq. ID No. 2092, Seq. ID No. 2106, Seq. ID No. 2108, Seq. ID No. 2110, Seq. ID No. 2114, Seq. ID No. 2116, Seq. ID No. 2122, Seq. ID No. 2124, Seq. ID No. 2126, Seq. ID No. 2128, Seq. ID No. 2150, Seq. ID No. 2152, Seq. ID No. 2156, Seq. ID No. 2158, Seq. ID No. 2160, Seq. ID No. 2172, Seq. ID No. 2174, Seq. ID No. 2178, Seq. ID No. 2188, Seq. ID No. 2192, Seq. ID No. 2206, Seq. ID No. 2238, Seq. ID No. 2240, Seq. ID No. 2246, Seq. ID No. 2250, Seq. ID No. 2252, Seq. ID No. 2256, Seq. ID No. 2260, Seq. ID No. 2272, Seq. ID No. 2284, Seq. ID No. 2290, Seq. ID No. 2292, Seq. ID No. 2294, Seq. ID No. 2296, Seq. ID No. 2304, Seq. ID No. 2306, Seq. ID No. 2308, Seq. ID No. 2318, Seq. ID No. 2320, Seq. ID No. 2322, Seq. ID No. 2324, Seq. ID No. 2326, Seq. ID No. 2328, Seq. ID No. 2330, Seq. ID No. 2334, Seq. ID No. 2344, Seq. ID No. 2348, Seq. ID No. 2350, Seq. ID No. 2352, Seq. ID No. 2354, Seq. ID No. 2356, Seq. ID No. 2358, Seq. ID No. 2366, Seq. ID No. 2368, Seq. ID No. 2372, Seq. ID No. 2376, Seq. ID No. 2388, Seq. ID No. 2390, Seq. ID No. 2392, Seq. ID No. 2394, Seq. ID No. 2408, Seq. ID No. 2420, Seq. ID No. 2422, Seq. ID No. 2426, Seq. ID No. 2428, Seq. ID No. 2430, Seq. ID No. 2434, Seq. ID No. 2450, Seq. ID No. 2460,

Seq. ID No. 2488, Seq. ID No. 2490, Seq. ID No. 2492, Seq. ID No. 2494, Seq. ID No. 2498, Seq. ID No. 2500, Seq. ID No. 2502, Seq. ID No. 2504, Seq. ID No. 2508, Seq. ID No. 2516, Seq. ID No. 2518, Seq. ID No. 2524, Seq. ID No. 2526, Seq. ID No. 2528, Seq. ID No. 2532, Seq. ID No. 2534, Seq. ID No. 2536, Seq. ID No. 2538, Seq. ID No. 2542, Seq. ID No. 2544, Seq. ID No. 2546, Seq. ID No. 2556, Seq. ID No. 2558, Seq. ID No. 2566, Seq. ID No. 2570, Seq. ID No. 2572, Seq. ID No. 2584, Seq. ID No. 2592, Seq. ID No. 2598, Seq. ID No. 2600, Seq. ID No. 2602, Seq. ID No. 2608, Seq. ID No. 2612, Seq. ID No. 2622, Seq. ID No. 2628, Seq. ID No. 2630, Seq. ID No. 2652, Seq. ID No. 2680, Seq. ID No. 2682, Seq. ID No. 2684, Seq. ID No. 2692, Seq. ID No. 2694, Seq. ID No. 2696, Seq. ID No. 2698, Seq. ID No. 2700, Seq. ID No. 2702, Seq. ID No. 2704, Seq. ID No. 2706, Seq. ID No. 2708, Seq. ID No. 2718, Seq. ID No. 2730, Seq. ID No. 2732, Seq. ID No. 2734, Seq. ID No. 2784, Seq. ID No. 2786, Seq. ID No. 2802, Seq. ID No. 2810, Seq. ID No. 2814, Seq. ID No. 2816, Seq. ID No. 2820, Seq. ID No. 2822, Seq. ID No. 2824, Seq. ID No. 2832, Seq. ID No. 2834, Seq. ID No. 2836, Seq. ID No. 2838, Seq. ID No. 2840, Seq. ID No. 2842, Seq. ID No. 2846, Seq. ID No. 2854, Seq. ID No. 2856, Seq. ID No. 2860, Seq. ID No. 2862, Seq. ID No. 2874, Seq. ID No. 2882, Seq. ID No. 2894, Seq. ID No. 2906, Seq. ID No. 2936, Seq. ID No. 2938, Seq. ID No. 2940, Seq. ID No. 2942, Seq. ID No. 2948, Seq. ID No. 2950, Seq. ID No. 2952, Seq. ID No. 2970, Seq. ID No. 2974, Seq. ID No. 2976, Seq. ID No. 2978, Seq. ID No. 2982, Seq. ID No. 2984, Seq. ID No. 2988, Seq. ID No. 2992, Seq. ID No. 2996, Seq. ID No. 2998, Seq. ID No. 3006, Seq. ID No. 3008, Seq. ID No. 3010, Seq. ID No. 3012, Seq. ID No. 3014, Seq. ID No. 3024, Seq. ID No. 3026, Seq. ID No. 3028, Seq. ID No. 3030, Seq. ID No. 3032, Seq. ID No. 3044, Seq. ID No. 3056, Seq. ID No. 3064, Seq. ID No. 3072, Seq. ID No. 3074, Seq. ID No. 3076, Seq. ID No. 3078, Seq. ID No. 3120, Seq. ID No. 3122, Seq. ID No. 3124, Seq. ID No. 3146, Seq. ID No. 3156, Seq. ID No. 3158, Seq. ID No. 3164, Seq. ID No. 3166, Seq. ID No. 3174, Seq. ID No. 3184, Seq. ID No. 3194, Seq. ID No. 3202, Seq. ID No. 3214, Seq. ID No. 3216, Seq. ID No. 3218, Seq. ID No. 3220, Seq. ID No. 3242, Seq. ID No. 3244, Seq. ID No. 3246, Seq. ID No. 3250, Seq. ID No. 3256, Seq. ID No. 3258, Seq. ID No. 3262, Seq. ID No. 3264, Seq. ID No. 3270, Seq. ID No. 3276, Seq. ID No. 3278, Seq. ID No. 3298, Seq. ID No. 3318, Seq. ID No. 3324, Seq. ID No. 3326, Seq. ID No. 3332, Seq. ID No. 3336, Seq. ID No. 3338, Seq. ID No. 3340, Seq. ID No. 3350, Seq. ID No. 3352, Seq. ID No. 3354, Seq. ID No. 3356, Seq. ID No. 3358, Seq. ID No. 3360, Seq. ID No. 3376, Seq. ID No. 3378,

Seq. ID No. 3390, Seq. ID No. 3392, Seq. ID No. 3396, Seq. ID No. 3406, Seq. ID No. 3416, Seq. ID No. 3422, Seq. ID No. 3426, Seq. ID No. 3428, Seq. ID No. 3434, Seq. ID No. 3442, Seq. ID No. 3450, Seq. ID No. 3452, Seq. ID No. 3454, Seq. ID No. 3456, Seq. ID No. 3458, Seq. ID No. 3464, Seq. ID No. 3482, Seq. ID No. 3492, Seq. ID No. 3494, Seq. ID No. 3504, Seq. ID No. 3506, Seq. ID No. 3518, Seq. ID No. 3520, Seq. ID No. 3528, Seq. ID No. 3532, Seq. ID No. 3540, Seq. ID No. 3562, Seq. ID No. 3574, Seq. ID No. 3582, Seq. ID No. 3588, Seq. ID No. 3594, Seq. ID No. 3596, Seq. ID No. 3612, Seq. ID No. 3618, Seq. ID No. 3620, Seq. ID No. 3622, Seq. ID No. 3626, Seq. ID No. 3630, Seq. ID No. 3636, Seq. ID No. 3678, Seq. ID No. 3680, Seq. ID No. 3690, Seq. ID No. 3718, Seq. ID No. 3724, Seq. ID No. 3728, Seq. ID No. 3742, Seq. ID No. 3746, Seq. ID No. 3754, Seq. ID No. 3756, Seq. ID No. 3758, Seq. ID No. 3762, Seq. ID No. 3764, Seq. ID No. 3766, Seq. ID No. 3782, Seq. ID No. 3784, Seq. ID No. 3794, Seq. ID No. 3800, Seq. ID No. 3808, Seq. ID No. 3814, Seq. ID No. 3816, Seq. ID No. 3818, Seq. ID No. 3838, Seq. ID No. 3840, Seq. ID No. 3850, Seq. ID No. 3852, Seq. ID No. 3854, Seq. ID No. 3860, Seq. ID No. 3862, Seq. ID No. 3864, Seq. ID No. 3866, Seq. ID No. 3880, Seq. ID No. 3890, Seq. ID No. 3892, Seq. ID No. 3896, Seq. ID No. 3904, Seq. ID No. 3916, Seq. ID No. 3924, Seq. ID No. 3926, Seq. ID No. 3960, Seq. ID No. 3964, Seq. ID No. 3974, Seq. ID No. 3976, Seq. ID No. 3994, Seq. ID No. 3996, Seq. ID No. 3998, Seq. ID No. 4006, Seq. ID No. 4008, Seq. ID No. 4010, Seq. ID No. 4026, Seq. ID No. 4028, Seq. ID No. 4040, Seq. ID No. 4042, Seq. ID No. 4044, Seq. ID No. 4046, Seq. ID No. 4048, Seq. ID No. 4050, Seq. ID No. 4062, Seq. ID No. 4072, Seq. ID No. 4074, Seq. ID No. 4080, Seq. ID No. 4082, Seq. ID No. 4084, Seq. ID No. 4102, Seq. ID No. 4104, Seq. ID No. 4112, Seq. ID No. 4134, Seq. ID No. 4136, Seq. ID No. 4138, Seq. ID No. 4140, Seq. ID No. 4142, Seq. ID No. 4144, Seq. ID No. 4146, Seq. ID No. 4152, Seq. ID No. 4154, Seq. ID No. 4182, Seq. ID No. 4222, Seq. ID No. 4224, Seq. ID No. 4226, Seq. ID No. 4228, Seq. ID No. 4232, Seq. ID No. 4234, Seq. ID No. 4242, Seq. ID No. 4248, Seq. ID No. 4254, Seq. ID No. 4258, Seq. ID No. 4260, Seq. ID No. 4262, Seq. ID No. 4264, Seq. ID No. 4266, Seq. ID No. 4270, Seq. ID No. 4276, Seq. ID No. 4286, Seq. ID No. 4288, Seq. ID No. 4298, Seq. ID No. 4308, Seq. ID No. 4312, Seq. ID No. 4314, Seq. ID No. 4344, Seq. ID No. 4380, Seq. ID No. 4386, Seq. ID No. 4390, Seq. ID No. 4392, Seq. ID No. 4400, Seq. ID No. 4404, Seq. ID No. 4438, Seq. ID No. 4440, Seq. ID No. 4442, Seq. ID No. 4470, Seq. ID No. 4474, Seq. ID No. 4482, Seq. ID No. 4484, Seq. ID No. 4486, Seq. ID No. 4494, Seq. ID No. 4496,



Seq. ID No. 4498, Seq. ID No. 4514, Seq. ID No. 4516, Seq. ID No. 4528, Seq. ID No. 4530, Seq. ID No. 4534, Seq. ID No. 4588, Seq. ID No. 4590, Seq. ID No. 4640, Seq. ID No. 4642, Seq. ID No. 4644, Seq. ID No. 4660, Seq. ID No. 4682, Seq. ID No. 4688, Seq. ID No. 4696, Seq. ID No. 4706, Seq. ID No. 4708, Seq. ID No. 4710, Seq. ID No. 4712, Seq. ID No. 4716, Seq. ID No. 4718, Seq. ID No. 4738, Seq. ID No. 4760, Seq. ID No. 4814, Seq. ID No. 4828, Seq. ID No. 4854, Seq. ID No. 4864, Seq. ID No. 4870, Seq. ID No. 4872, Seq. ID No. 4874, Seq. ID No. 4876, Seq. ID No. 4920, Seq. ID No. 4922, Seq. ID No. 4924, Seq. ID No. 4930, Seq. ID No. 4932, Seq. ID No. 4950, Seq. ID No. 4952, Seq. ID No. 4976, Seq. ID No. 4988, Seq. ID No. 5000, Seq. ID No. 5014, Seq. ID No. 5032, Seq. ID No. 5062, Seq. ID No. 5064, Seq. ID No. 5070, Seq. ID No. 5086, Seq. ID No. 5104, Seq. ID No. 5116, Seq. ID No. 5124, Seq. ID No. 5126, Seq. ID No. 5130, Seq. ID No. 5132, Seq. ID No. 5134, Seq. ID No. 5136, Seq. ID No. 5138, Seq. ID No. 5140, Seq. ID No. 5142, Seq. ID No. 5160, Seq. ID No. 5166, Seq. ID No. 5176, Seq. ID No. 5198, Seq. ID No. 5200, Seq. ID No. 5206, Seq. ID No. 5208, Seq. ID No. 5214, Seq. ID No. 5220, Seq. ID No. 5224, Seq. ID No. 5268, Seq. ID No. 5274, Seq. ID No. 5276, Seq. ID No. 5278, Seq. ID No. 5280, Seq. ID No. 5282, Seq. ID No. 5286, Seq. ID No. 5328, Seq. ID No. 5330, Seq. ID No. 5332, Seq. ID No. 5342, Seq. ID No. 5378, Seq. ID No. 5380, Seq. ID No. 5386, Seq. ID No. 5388, Seq. ID No. 5406, Seq. ID No. 5414, Seq. ID No. 5416, Seq. ID No. 5434, Seq. ID No. 5454, Seq. ID No. 5460, Seq. ID No. 5462, Seq. ID No. 5464, Seq. ID No. 5466, Seq. ID No. 5492, Seq. ID No. 5498, Seq. ID No. 5510, Seq. ID No. 5514, Seq. ID No. 5516, Seq. ID No. 5518, Seq. ID No. 5526, Seq. ID No. 5530, Seq. ID No. 5532, Seq. ID No. 5534, Seq. ID No. 5544, Seq. ID No. 5546, Seq. ID No. 5570, Seq. ID No. 5588, Seq. ID No. 5590, Seq. ID No. 5592, Seq. ID No. 5594, Seq. ID No. 5596, Seq. ID No. 5598, Seq. ID No. 5610, Seq. ID No. 5612, Seq. ID No. 5622, Seq. ID No. 5624, Seq. ID No. 5626, Seq. ID No. 5634, Seq. ID No. 5638, Seq. ID No. 5640, Seq. ID No. 5642, Seq. ID No. 5644, Seq. ID No. 5650, Seq. ID No. 5660, Seq. ID No. 5668, Seq. ID No. 5682, Seq. ID No. 5684, Seq. ID No. 5686, Seq. ID No. 5688, Seq. ID No. 5690, Seq. ID No. 5700, Seq. ID No. 5704, Seq. ID No. 5706, Seq. ID No. 5710, Seq. ID No. 5712, Seq. ID No. 5720, Seq. ID No. 5730, Seq. ID No. 5734, Seq. ID No. 5736, Seq. ID No. 5740, Seq. ID No. 5764, Seq. ID No. 5766, Seq. ID No. 5768, Seq. ID No. 5772, Seq. ID No. 5784, Seq. ID No. 5786, Seq. ID No. 5792, Seq. ID No. 5798, Seq. ID No. 5830, Seq. ID No. 5880, Seq. ID No. 5884, Seq. ID No. 5886, Seq. ID No. 5890, Seq. ID No. 5894, Seq. ID No. 5896,

Seq. ID No. 5900, Seq. ID No. 5902, Seq. ID No. 5906, Seq. ID No. 5910, Seq. ID No. 5922, Seq. ID No. 5924, Seq. ID No. 5928, Seq. ID No. 5930, Seq. ID No. 5940, Seq. ID No. 6024, Seq. ID No. 6026, Seq. ID No. 6028, Seq. ID No. 6044, Seq. ID No. 6048, Seq. ID No. 6054, Seq. ID No. 6060, Seq. ID No. 6064, Seq. ID No. 6068, Seq. ID No. 6088, Seq. ID No. 6090, Seq. ID No. 6092, Seq. ID No. 6096, Seq. ID No. 6104, Seq. ID No. 6108, Seq. ID No. 6110, Seq. ID No. 6112, Seq. ID No. 6116, Seq. ID No. 6118, Seq. ID No. 6136, Seq. ID No. 6138, Seq. ID No. 6160, Seq. ID No. 6162, Seq. ID No. 6164, Seq. ID No. 6166, Seq. ID No. 6170, Seq. ID No. 6184, Seq. ID No. 6186, Seq. ID No. 6188, Seq. ID No. 6190, Seq. ID No. 6192, Seq. ID No. 6198, Seq. ID No. 6204, Seq. ID No. 6206, Seq. ID No. 6210, Seq. ID No. 6218, Seq. ID No. 6222, Seq. ID No. 6224, Seq. ID No. 6226, Seq. ID No. 6228, Seq. ID No. 6230, Seq. ID No. 6236, Seq. ID No. 6238, Seq. ID No. 6242, Seq. ID No. 6244, Seq. ID No. 6246, Seq. ID No. 6250, Seq. ID No. 6254, Seq. ID No. 6260, Seq. ID No. 6264, Seq. ID No. 6266, Seq. ID No. 6268, Seq. ID No. 6274, Seq. ID No. 6276, Seq. ID No. 6284, Seq. ID No. 6286, Seq. ID No. 6290, Seq. ID No. 6302, Seq. ID No. 6304, Seq. ID No. 6326, Seq. ID No. 6328, Seq. ID No. 6364, Seq. ID No. 6366, Seq. ID No. 6378, Seq. ID No. 6382, Seq. ID No. 6384, Seq. ID No. 6416, Seq. ID No. 6426, Seq. ID No. 6428, Seq. ID No. 6430, Seq. ID No. 6432, Seq. ID No. 6474, Seq. ID No. 6480, Seq. ID No. 6498, Seq. ID No. 6518, Seq. ID No. 6542, Seq. ID No. 6544, Seq. ID No. 6556, Seq. ID No. 6558, Seq. ID No. 6572, Seq. ID No. 6574, Seq. ID No. 6582, Seq. ID No. 6594, Seq. ID No. 6596, Seq. ID No. 6598, Seq. ID No. 6600, Seq. ID No. 6602, Seq. ID No. 6604, Seq. ID No. 6632, Seq. ID No. 6638, Seq. ID No. 6640, Seq. ID No. 6644, Seq. ID No. 6646, and Seq. ID No. 6650.

In yet another embodiment, the *Alloiococcus otitidis* polypeptide is one that is predicted by HMM SignalP algorithm analysis as being a non-secretory protein, and is selected from one of Seq. ID No. 2, Seq. ID No. 6, Seq. ID No. 12, Seq. ID No. 14, Seq. ID No. 16, Seq. ID No. 18, Seq. ID No. 24, Seq. ID No. 26, Seq. ID No. 28, Seq. ID No. 30, Seq. ID No. 36, Seq. ID No. 38, Seq. ID No. 40, Seq. ID No. 42, Seq. ID No. 44, Seq. ID No. 52, Seq. ID No. 56, Seq. ID No. 58, Seq. ID No. 60, Seq. ID No. 62, Seq. ID No. 64, Seq. ID No. 70, Seq. ID No. 72, Seq. ID No. 74, Seq. ID No. 76, Seq. ID No. 78, Seq. ID No. 80, Seq. ID No. 82, Seq. ID No. 84, Seq. ID No. 90, Seq. ID No. 92, Seq. ID No. 94, Seq. ID No. 96, Seq. ID No. 98, Seq. ID No. 100, Seq. ID No. 102, Seq. ID No. 104, Seq. ID No. 108, Seq. ID No. 110, Seq. ID No. 114, Seq. ID No. 116, Seq. ID No. 118,

Seq. ID No. 120, Seq. ID No. 122, Seq. ID No. 126, Seq. ID No. 128, Seq. ID No. 130,  
Seq. ID No. 136, Seq. ID No. 138, Seq. ID No. 140, Seq. ID No. 144, Seq. ID No. 146,  
Seq. ID No. 148, Seq. ID No. 150, Seq. ID No. 152, Seq. ID No. 154, Seq. ID No. 156,  
Seq. ID No. 158, Seq. ID No. 166, Seq. ID No. 168, Seq. ID No. 170, Seq. ID No. 174,  
5 Seq. ID No. 176, Seq. ID No. 178, Seq. ID No. 180, Seq. ID No. 182, Seq. ID No. 184,  
Seq. ID No. 186, Seq. ID No. 188, Seq. ID No. 190, Seq. ID No. 194, Seq. ID No. 196,  
Seq. ID No. 198, Seq. ID No. 200, Seq. ID No. 202, Seq. ID No. 204, Seq. ID No. 206,  
Seq. ID No. 208, Seq. ID No. 220, Seq. ID No. 222, Seq. ID No. 224, Seq. ID No. 228,  
Seq. ID No. 230, Seq. ID No. 232, Seq. ID No. 234, Seq. ID No. 240, Seq. ID No. 242,  
10 Seq. ID No. 244, Seq. ID No. 246, Seq. ID No. 248, Seq. ID No. 254, Seq. ID No. 262,  
Seq. ID No. 264, Seq. ID No. 266, Seq. ID No. 268, Seq. ID No. 270, Seq. ID No. 276,  
Seq. ID No. 280, Seq. ID No. 282, Seq. ID No. 284, Seq. ID No. 292, Seq. ID No. 294,  
Seq. ID No. 296, Seq. ID No. 298, Seq. ID No. 300, Seq. ID No. 302, Seq. ID No. 304,  
Seq. ID No. 306, Seq. ID No. 308, Seq. ID No. 310, Seq. ID No. 312, Seq. ID No. 314,  
15 Seq. ID No. 316, Seq. ID No. 318, Seq. ID No. 320, Seq. ID No. 322, Seq. ID No. 324,  
Seq. ID No. 326, Seq. ID No. 332, Seq. ID No. 334, Seq. ID No. 336, Seq. ID No. 338,  
Seq. ID No. 340, Seq. ID No. 342, Seq. ID No. 344, Seq. ID No. 346, Seq. ID No. 348,  
Seq. ID No. 350, Seq. ID No. 352, Seq. ID No. 354, Seq. ID No. 356, Seq. ID No. 362,  
Seq. ID No. 364, Seq. ID No. 366, Seq. ID No. 368, Seq. ID No. 370, Seq. ID No. 372,  
20 Seq. ID No. 378, Seq. ID No. 380, Seq. ID No. 382, Seq. ID No. 384, Seq. ID No. 386,  
Seq. ID No. 388, Seq. ID No. 390, Seq. ID No. 392, Seq. ID No. 396, Seq. ID No. 398,  
Seq. ID No. 400, Seq. ID No. 406, Seq. ID No. 408, Seq. ID No. 410, Seq. ID No. 412,  
Seq. ID No. 414, Seq. ID No. 416, Seq. ID No. 418, Seq. ID No. 420, Seq. ID No. 422,  
Seq. ID No. 424, Seq. ID No. 426, Seq. ID No. 428, Seq. ID No. 430, Seq. ID No. 432,  
25 Seq. ID No. 434, Seq. ID No. 436, Seq. ID No. 438, Seq. ID No. 440, Seq. ID No. 442,  
Seq. ID No. 444, Seq. ID No. 446, Seq. ID No. 448, Seq. ID No. 450, Seq. ID No. 452,  
Seq. ID No. 454, Seq. ID No. 460, Seq. ID No. 462, Seq. ID No. 464, Seq. ID No. 466,  
Seq. ID No. 468, Seq. ID No. 470, Seq. ID No. 472, Seq. ID No. 474, Seq. ID No. 476,  
Seq. ID No. 480, Seq. ID No. 482, Seq. ID No. 484, Seq. ID No. 486, Seq. ID No. 502,  
30 Seq. ID No. 508, Seq. ID No. 518, Seq. ID No. 520, Seq. ID No. 522, Seq. ID No. 524,  
Seq. ID No. 530, Seq. ID No. 532, Seq. ID No. 534, Seq. ID No. 536, Seq. ID No. 538,  
Seq. ID No. 540, Seq. ID No. 542, Seq. ID No. 544, Seq. ID No. 552, Seq. ID No. 554,  
Seq. ID No. 556, Seq. ID No. 560, Seq. ID No. 562, Seq. ID No. 564, Seq. ID No. 566,

Seq. ID No. 572, Seq. ID No. 574, Seq. ID No. 582, Seq. ID No. 584, Seq. ID No. 586,  
Seq. ID No. 588, Seq. ID No. 590, Seq. ID No. 596, Seq. ID No. 598, Seq. ID No. 602,  
Seq. ID No. 604, Seq. ID No. 606, Seq. ID No. 608, Seq. ID No. 610, Seq. ID No. 612,  
Seq. ID No. 614, Seq. ID No. 616, Seq. ID No. 620, Seq. ID No. 622, Seq. ID No. 624,  
5 Seq. ID No. 626, Seq. ID No. 628, Seq. ID No. 630, Seq. ID No. 632, Seq. ID No. 634,  
Seq. ID No. 636, Seq. ID No. 650, Seq. ID No. 652, Seq. ID No. 664, Seq. ID No. 666,  
Seq. ID No. 672, Seq. ID No. 674, Seq. ID No. 682, Seq. ID No. 684, Seq. ID No. 686,  
Seq. ID No. 688, Seq. ID No. 690, Seq. ID No. 692, Seq. ID No. 694, Seq. ID No. 696,  
Seq. ID No. 698, Seq. ID No. 700, Seq. ID No. 702, Seq. ID No. 704, Seq. ID No. 706,  
10 Seq. ID No. 708, Seq. ID No. 710, Seq. ID No. 712, Seq. ID No. 714, Seq. ID No. 728,  
Seq. ID No. 730, Seq. ID No. 732, Seq. ID No. 734, Seq. ID No. 736, Seq. ID No. 738,  
Seq. ID No. 740, Seq. ID No. 742, Seq. ID No. 744, Seq. ID No. 754, Seq. ID No. 768,  
Seq. ID No. 772, Seq. ID No. 774, Seq. ID No. 776, Seq. ID No. 784, Seq. ID No. 786,  
Seq. ID No. 788, Seq. ID No. 790, Seq. ID No. 792, Seq. ID No. 794, Seq. ID No. 796,  
15 Seq. ID No. 798, Seq. ID No. 800, Seq. ID No. 802, Seq. ID No. 804, Seq. ID No. 806,  
Seq. ID No. 812, Seq. ID No. 814, Seq. ID No. 816, Seq. ID No. 818, Seq. ID No. 822,  
Seq. ID No. 824, Seq. ID No. 828, Seq. ID No. 830, Seq. ID No. 832, Seq. ID No. 834,  
Seq. ID No. 836, Seq. ID No. 838, Seq. ID No. 840, Seq. ID No. 842, Seq. ID No. 844,  
Seq. ID No. 846, Seq. ID No. 848, Seq. ID No. 850, Seq. ID No. 852, Seq. ID No. 854,  
20 Seq. ID No. 856, Seq. ID No. 858, Seq. ID No. 860, Seq. ID No. 862, Seq. ID No. 866,  
Seq. ID No. 868, Seq. ID No. 870, Seq. ID No. 872, Seq. ID No. 874, Seq. ID No. 876,  
Seq. ID No. 878, Seq. ID No. 880, Seq. ID No. 882, Seq. ID No. 884, Seq. ID No. 886,  
Seq. ID No. 888, Seq. ID No. 890, Seq. ID No. 892, Seq. ID No. 896, Seq. ID No. 898,  
Seq. ID No. 900, Seq. ID No. 904, Seq. ID No. 906, Seq. ID No. 908, Seq. ID No. 910,  
25 Seq. ID No. 912, Seq. ID No. 914, Seq. ID No. 916, Seq. ID No. 918, Seq. ID No. 920,  
Seq. ID No. 922, Seq. ID No. 924, Seq. ID No. 926, Seq. ID No. 928, Seq. ID No. 930,  
Seq. ID No. 932, Seq. ID No. 934, Seq. ID No. 940, Seq. ID No. 946, Seq. ID No. 948,  
Seq. ID No. 950, Seq. ID No. 952, Seq. ID No. 954, Seq. ID No. 960, Seq. ID No. 962,  
Seq. ID No. 964, Seq. ID No. 966, Seq. ID No. 970, Seq. ID No. 972, Seq. ID No. 974,  
30 Seq. ID No. 976, Seq. ID No. 978, Seq. ID No. 988, Seq. ID No. 990, Seq. ID No. 992,  
Seq. ID No. 994, Seq. ID No. 996, Seq. ID No. 998, Seq. ID No. 1000, Seq. ID No. 1018,  
Seq. ID No. 1022, Seq. ID No. 1024, Seq. ID No. 1026, Seq. ID No. 1028, Seq. ID No.  
1042, Seq. ID No. 1044, Seq. ID No. 1048, Seq. ID No. 1050, Seq. ID No. 1052, Seq. ID

No. 1054, Seq. ID No. 1058, Seq. ID No. 1060, Seq. ID No. 1062, Seq. ID No. 1064,  
Seq. ID No. 1066, Seq. ID No. 1068, Seq. ID No. 1070, Seq. ID No. 1072, Seq. ID No.  
1074, Seq. ID No. 1080, Seq. ID No. 1082, Seq. ID No. 1084, Seq. ID No. 1086, Seq. ID  
No. 1088, Seq. ID No. 1090, Seq. ID No. 1092, Seq. ID No. 1094, Seq. ID No. 1096,  
5 Seq. ID No. 1098, Seq. ID No. 1100, Seq. ID No. 1102, Seq. ID No. 1104, Seq. ID No.  
1110, Seq. ID No. 1112, Seq. ID No. 1114, Seq. ID No. 1116, Seq. ID No. 1118, Seq. ID  
No. 1120, Seq. ID No. 1122, Seq. ID No. 1124, Seq. ID No. 1126, Seq. ID No. 1128,  
Seq. ID No. 1130, Seq. ID No. 1134, Seq. ID No. 1142, Seq. ID No. 1144, Seq. ID No.  
1146, Seq. ID No. 1148, Seq. ID No. 1150, Seq. ID No. 1154, Seq. ID No. 1156, Seq. ID  
10 No. 1158, Seq. ID No. 1160, Seq. ID No. 1162, Seq. ID No. 1164, Seq. ID No. 1172,  
Seq. ID No. 1176, Seq. ID No. 1178, Seq. ID No. 1180, Seq. ID No. 1182, Seq. ID No.  
1186, Seq. ID No. 1188, Seq. ID No. 1190, Seq. ID No. 1192, Seq. ID No. 1194, Seq. ID  
No. 1200, Seq. ID No. 1202, Seq. ID No. 1206, Seq. ID No. 1208, Seq. ID No. 1210,  
Seq. ID No. 1212, Seq. ID No. 1216, Seq. ID No. 1218, Seq. ID No. 1220, Seq. ID No.  
15 1222, Seq. ID No. 1226, Seq. ID No. 1232, Seq. ID No. 1234, Seq. ID No. 1236, Seq. ID  
No. 1240, Seq. ID No. 1242, Seq. ID No. 1248, Seq. ID No. 1250, Seq. ID No. 1252,  
Seq. ID No. 1254, Seq. ID No. 1256, Seq. ID No. 1258, Seq. ID No. 1262, Seq. ID No.  
1264, Seq. ID No. 1274, Seq. ID No. 1276, Seq. ID No. 1278, Seq. ID No. 1280, Seq. ID  
No. 1282, Seq. ID No. 1286, Seq. ID No. 1294, Seq. ID No. 1300, Seq. ID No. 1302,  
20 Seq. ID No. 1308, Seq. ID No. 1310, Seq. ID No. 1312, Seq. ID No. 1314, Seq. ID No.  
1322, Seq. ID No. 1324, Seq. ID No. 1334, Seq. ID No. 1336, Seq. ID No. 1340, Seq. ID  
No. 1346, Seq. ID No. 1356, Seq. ID No. 1358, Seq. ID No. 1360, Seq. ID No. 1362,  
Seq. ID No. 1364, Seq. ID No. 1374, Seq. ID No. 1376, Seq. ID No. 1378, Seq. ID No.  
1380, Seq. ID No. 1384, Seq. ID No. 1386, Seq. ID No. 1388, Seq. ID No. 1390, Seq. ID  
25 No. 1392, Seq. ID No. 1394, Seq. ID No. 1396, Seq. ID No. 1398, Seq. ID No. 1400,  
Seq. ID No. 1404, Seq. ID No. 1406, Seq. ID No. 1408, Seq. ID No. 1410, Seq. ID No.  
1412, Seq. ID No. 1414, Seq. ID No. 1416, Seq. ID No. 1418, Seq. ID No. 1420, Seq. ID  
No. 1422, Seq. ID No. 1424, Seq. ID No. 1426, Seq. ID No. 1428, Seq. ID No. 1432,  
Seq. ID No. 1434, Seq. ID No. 1438, Seq. ID No. 1440, Seq. ID No. 1442, Seq. ID No.  
30 1444, Seq. ID No. 1450, Seq. ID No. 1452, Seq. ID No. 1454, Seq. ID No. 1456, Seq. ID  
No. 1458, Seq. ID No. 1460, Seq. ID No. 1462, Seq. ID No. 1464, Seq. ID No. 1466,  
Seq. ID No. 1468, Seq. ID No. 1470, Seq. ID No. 1472, Seq. ID No. 1474, Seq. ID No.  
1476, Seq. ID No. 1478, Seq. ID No. 1480, Seq. ID No. 1484, Seq. ID No. 1486, Seq. ID

No. 1488, Seq. ID No. 1490, Seq. ID No. 1492, Seq. ID No. 1494, Seq. ID No. 1496,  
Seq. ID No. 1498, Seq. ID No. 1500, Seq. ID No. 1502, Seq. ID No. 1504, Seq. ID No.  
1506, Seq. ID No. 1508, Seq. ID No. 1510, Seq. ID No. 1512, Seq. ID No. 1520, Seq. ID  
No. 1522, Seq. ID No. 1524, Seq. ID No. 1526, Seq. ID No. 1528, Seq. ID No. 1532,  
5 Seq. ID No. 1538, Seq. ID No. 1540, Seq. ID No. 1542, Seq. ID No. 1544, Seq. ID No.  
1550, Seq. ID No. 1556, Seq. ID No. 1558, Seq. ID No. 1566, Seq. ID No. 1568, Seq. ID  
No. 1570, Seq. ID No. 1574, Seq. ID No. 1576, Seq. ID No. 1578, Seq. ID No. 1582,  
Seq. ID No. 1588, Seq. ID No. 1590, Seq. ID No. 1592, Seq. ID No. 1594, Seq. ID No.  
1596, Seq. ID No. 1598, Seq. ID No. 1602, Seq. ID No. 1604, Seq. ID No. 1606, Seq. ID  
10 No. 1608, Seq. ID No. 1610, Seq. ID No. 1612, Seq. ID No. 1614, Seq. ID No. 1616,  
Seq. ID No. 1618, Seq. ID No. 1620, Seq. ID No. 1624, Seq. ID No. 1626, Seq. ID No.  
1628, Seq. ID No. 1630, Seq. ID No. 1632, Seq. ID No. 1636, Seq. ID No. 1638, Seq. ID  
No. 1642, Seq. ID No. 1652, Seq. ID No. 1656, Seq. ID No. 1658, Seq. ID No. 1660,  
Seq. ID No. 1668, Seq. ID No. 1670, Seq. ID No. 1676, Seq. ID No. 1684, Seq. ID No.  
15 1686, Seq. ID No. 1688, Seq. ID No. 1690, Seq. ID No. 1692, Seq. ID No. 1696, Seq. ID  
No. 1698, Seq. ID No. 1700, Seq. ID No. 1702, Seq. ID No. 1704, Seq. ID No. 1706,  
Seq. ID No. 1710, Seq. ID No. 1714, Seq. ID No. 1716, Seq. ID No. 1718, Seq. ID No.  
1720, Seq. ID No. 1722, Seq. ID No. 1724, Seq. ID No. 1726, Seq. ID No. 1728, Seq. ID  
No. 1730, Seq. ID No. 1736, Seq. ID No. 1740, Seq. ID No. 1742, Seq. ID No. 1744,  
20 Seq. ID No. 1746, Seq. ID No. 1748, Seq. ID No. 1750, Seq. ID No. 1752, Seq. ID No.  
1760, Seq. ID No. 1762, Seq. ID No. 1764, Seq. ID No. 1770, Seq. ID No. 1774, Seq. ID  
No. 1776, Seq. ID No. 1778, Seq. ID No. 1780, Seq. ID No. 1784, Seq. ID No. 1786,  
Seq. ID No. 1790, Seq. ID No. 1794, Seq. ID No. 1796, Seq. ID No. 1800, Seq. ID No.  
1802, Seq. ID No. 1804, Seq. ID No. 1808, Seq. ID No. 1810, Seq. ID No. 1812, Seq. ID  
25 No. 1814, Seq. ID No. 1816, Seq. ID No. 1818, Seq. ID No. 1826, Seq. ID No. 1828,  
Seq. ID No. 1830, Seq. ID No. 1832, Seq. ID No. 1834, Seq. ID No. 1836, Seq. ID No.  
1838, Seq. ID No. 1842, Seq. ID No. 1844, Seq. ID No. 1846, Seq. ID No. 1848, Seq. ID  
No. 1850, Seq. ID No. 1852, Seq. ID No. 1854, Seq. ID No. 1856, Seq. ID No. 1860,  
Seq. ID No. 1862, Seq. ID No. 1864, Seq. ID No. 1866, Seq. ID No. 1868, Seq. ID No.  
30 1872, Seq. ID No. 1874, Seq. ID No. 1878, Seq. ID No. 1880, Seq. ID No. 1882, Seq. ID  
No. 1884, Seq. ID No. 1886, Seq. ID No. 1888, Seq. ID No. 1890, Seq. ID No. 1898,  
Seq. ID No. 1900, Seq. ID No. 1902, Seq. ID No. 1904, Seq. ID No. 1906, Seq. ID No.  
1908, Seq. ID No. 1910, Seq. ID No. 1912, Seq. ID No. 1914, Seq. ID No. 1922, Seq. ID

No. 1926, Seq. ID No. 1932, Seq. ID No. 1934, Seq. ID No. 1936, Seq. ID No. 1938,  
Seq. ID No. 1940, Seq. ID No. 1942, Seq. ID No. 1944, Seq. ID No. 1946, Seq. ID No.  
1948, Seq. ID No. 1950, Seq. ID No. 1952, Seq. ID No. 1954, Seq. ID No. 1956, Seq. ID  
5 Seq. ID No. 1968, Seq. ID No. 1972, Seq. ID No. 1974, Seq. ID No. 1976, Seq. ID No.  
1978, Seq. ID No. 1980, Seq. ID No. 1984, Seq. ID No. 1986, Seq. ID No. 1988, Seq. ID  
No. 1990, Seq. ID No. 1996, Seq. ID No. 1998, Seq. ID No. 2000, Seq. ID No. 2002,  
Seq. ID No. 2004, Seq. ID No. 2008, Seq. ID No. 2010, Seq. ID No. 2012, Seq. ID No.  
2016, Seq. ID No. 2022, Seq. ID No. 2024, Seq. ID No. 2030, Seq. ID No. 2032, Seq. ID  
10 No. 2038, Seq. ID No. 2040, Seq. ID No. 2044, Seq. ID No. 2046, Seq. ID No. 2048,  
Seq. ID No. 2052, Seq. ID No. 2058, Seq. ID No. 2060, Seq. ID No. 2062, Seq. ID No.  
2064, Seq. ID No. 2066, Seq. ID No. 2068, Seq. ID No. 2070, Seq. ID No. 2072, Seq. ID  
No. 2074, Seq. ID No. 2076, Seq. ID No. 2078, Seq. ID No. 2080, Seq. ID No. 2082,  
Seq. ID No. 2084, Seq. ID No. 2086, Seq. ID No. 2094, Seq. ID No. 2096, Seq. ID No.  
15 2098, Seq. ID No. 2100, Seq. ID No. 2102, Seq. ID No. 2104, Seq. ID No. 2112, Seq. ID  
No. 2118, Seq. ID No. 2120, Seq. ID No. 2130, Seq. ID No. 2132, Seq. ID No. 2134,  
Seq. ID No. 2136, Seq. ID No. 2138, Seq. ID No. 2140, Seq. ID No. 2142, Seq. ID No.  
2144, Seq. ID No. 2146, Seq. ID No. 2148, Seq. ID No. 2154, Seq. ID No. 2162, Seq. ID  
No. 2164, Seq. ID No. 2166, Seq. ID No. 2168, Seq. ID No. 2170, Seq. ID No. 2176,  
20 Seq. ID No. 2180, Seq. ID No. 2182, Seq. ID No. 2184, Seq. ID No. 2186, Seq. ID No.  
2190, Seq. ID No. 2194, Seq. ID No. 2196, Seq. ID No. 2198, Seq. ID No. 2200, Seq. ID  
No. 2202, Seq. ID No. 2204, Seq. ID No. 2208, Seq. ID No. 2210, Seq. ID No. 2212,  
Seq. ID No. 2214, Seq. ID No. 2216, Seq. ID No. 2218, Seq. ID No. 2220, Seq. ID No.  
2222, Seq. ID No. 2224, Seq. ID No. 2226, Seq. ID No. 2228, Seq. ID No. 2230, Seq. ID  
25 No. 2232, Seq. ID No. 2234, Seq. ID No. 2236, Seq. ID No. 2242, Seq. ID No. 2244,  
Seq. ID No. 2248, Seq. ID No. 2254, Seq. ID No. 2258, Seq. ID No. 2262, Seq. ID No.  
2264, Seq. ID No. 2266, Seq. ID No. 2268, Seq. ID No. 2270, Seq. ID No. 2274, Seq. ID  
No. 2276, Seq. ID No. 2278, Seq. ID No. 2280, Seq. ID No. 2282, Seq. ID No. 2286,  
Seq. ID No. 2288, Seq. ID No. 2298, Seq. ID No. 2300, Seq. ID No. 2302, Seq. ID No.  
30 2310, Seq. ID No. 2312, Seq. ID No. 2314, Seq. ID No. 2316, Seq. ID No. 2332, Seq. ID  
No. 2336, Seq. ID No. 2338, Seq. ID No. 2340, Seq. ID No. 2342, Seq. ID No. 2346,  
Seq. ID No. 2360, Seq. ID No. 2362, Seq. ID No. 2364, Seq. ID No. 2370, Seq. ID No.  
2374, Seq. ID No. 2378, Seq. ID No. 2380, Seq. ID No. 2382, Seq. ID No. 2384, Seq. ID

No. 2386, Seq. ID No. 2396, Seq. ID No. 2398, Seq. ID No. 2400, Seq. ID No. 2402,  
Seq. ID No. 2404, Seq. ID No. 2406, Seq. ID No. 2410, Seq. ID No. 2412, Seq. ID No.  
2414, Seq. ID No. 2416, Seq. ID No. 2418, Seq. ID No. 2424, Seq. ID No. 2432, Seq. ID  
No. 2436, Seq. ID No. 2438, Seq. ID No. 2440, Seq. ID No. 2442, Seq. ID No. 2444,  
5 Seq. ID No. 2446, Seq. ID No. 2448, Seq. ID No. 2452, Seq. ID No. 2454, Seq. ID No.  
2456, Seq. ID No. 2458, Seq. ID No. 2462, Seq. ID No. 2464, Seq. ID No. 2466, Seq. ID  
No. 2468, Seq. ID No. 2470, Seq. ID No. 2472, Seq. ID No. 2474, Seq. ID No. 2476,  
Seq. ID No. 2478, Seq. ID No. 2480, Seq. ID No. 2482, Seq. ID No. 2484, Seq. ID No.  
2486, Seq. ID No. 2496, Seq. ID No. 2506, Seq. ID No. 2510, Seq. ID No. 2512, Seq. ID  
10 No. 2514, Seq. ID No. 2520, Seq. ID No. 2522, Seq. ID No. 2530, Seq. ID No. 2540,  
Seq. ID No. 2548, Seq. ID No. 2550, Seq. ID No. 2552, Seq. ID No. 2554, Seq. ID No.  
2560, Seq. ID No. 2562, Seq. ID No. 2564, Seq. ID No. 2568, Seq. ID No. 2574, Seq. ID  
No. 2576, Seq. ID No. 2578, Seq. ID No. 2580, Seq. ID No. 2582, Seq. ID No. 2586,  
Seq. ID No. 2588, Seq. ID No. 2590, Seq. ID No. 2594, Seq. ID No. 2596, Seq. ID No.  
15 2604, Seq. ID No. 2606, Seq. ID No. 2610, Seq. ID No. 2614, Seq. ID No. 2616, Seq. ID  
No. 2618, Seq. ID No. 2620, Seq. ID No. 2624, Seq. ID No. 2626, Seq. ID No. 2632,  
Seq. ID No. 2634, Seq. ID No. 2636, Seq. ID No. 2638, Seq. ID No. 2640, Seq. ID No.  
2642, Seq. ID No. 2644, Seq. ID No. 2646, Seq. ID No. 2648, Seq. ID No. 2650, Seq. ID  
No. 2654, Seq. ID No. 2656, Seq. ID No. 2658, Seq. ID No. 2660, Seq. ID No. 2662,  
20 Seq. ID No. 2664, Seq. ID No. 2666, Seq. ID No. 2668, Seq. ID No. 2670, Seq. ID No.  
2672, Seq. ID No. 2674, Seq. ID No. 2676, Seq. ID No. 2678, Seq. ID No. 2686, Seq. ID  
No. 2688, Seq. ID No. 2690, Seq. ID No. 2710, Seq. ID No. 2712, Seq. ID No. 2714,  
Seq. ID No. 2716, Seq. ID No. 2720, Seq. ID No. 2722, Seq. ID No. 2724, Seq. ID No.  
2726, Seq. ID No. 2728, Seq. ID No. 2736, Seq. ID No. 2738, Seq. ID No. 2740, Seq. ID  
25 No. 2742, Seq. ID No. 2744, Seq. ID No. 2746, Seq. ID No. 2748, Seq. ID No. 2750,  
Seq. ID No. 2752, Seq. ID No. 2754, Seq. ID No. 2756, Seq. ID No. 2758, Seq. ID No.  
2760, Seq. ID No. 2762, Seq. ID No. 2764, Seq. ID No. 2766, Seq. ID No. 2768, Seq. ID  
No. 2770, Seq. ID No. 2772, Seq. ID No. 2774, Seq. ID No. 2776, Seq. ID No. 2778,  
Seq. ID No. 2780, Seq. ID No. 2782, Seq. ID No. 2788, Seq. ID No. 2790, Seq. ID No.  
30 2792, Seq. ID No. 2794, Seq. ID No. 2796, Seq. ID No. 2798, Seq. ID No. 2800, Seq. ID  
No. 2804, Seq. ID No. 2806, Seq. ID No. 2808, Seq. ID No. 2812, Seq. ID No. 2818,  
Seq. ID No. 2826, Seq. ID No. 2828, Seq. ID No. 2830, Seq. ID No. 2844, Seq. ID No.  
2848, Seq. ID No. 2850, Seq. ID No. 2852, Seq. ID No. 2858, Seq. ID No. 2864, Seq. ID



No. 2866, Seq. ID No. 2868, Seq. ID No. 2870, Seq. ID No. 2872, Seq. ID No. 2876,  
Seq. ID No. 2878, Seq. ID No. 2880, Seq. ID No. 2884, Seq. ID No. 2886, Seq. ID No.  
2888, Seq. ID No. 2890, Seq. ID No. 2892, Seq. ID No. 2896, Seq. ID No. 2898, Seq. ID  
5 No. 2900, Seq. ID No. 2902, Seq. ID No. 2904, Seq. ID No. 2908, Seq. ID No. 2910,  
Seq. ID No. 2912, Seq. ID No. 2914, Seq. ID No. 2916, Seq. ID No. 2918, Seq. ID No.  
2920, Seq. ID No. 2922, Seq. ID No. 2924, Seq. ID No. 2926, Seq. ID No. 2928, Seq. ID  
No. 2930, Seq. ID No. 2932, Seq. ID No. 2934, Seq. ID No. 2944, Seq. ID No. 2946,  
Seq. ID No. 2954, Seq. ID No. 2956, Seq. ID No. 2958, Seq. ID No. 2960, Seq. ID No.  
2962, Seq. ID No. 2964, Seq. ID No. 2966, Seq. ID No. 2968, Seq. ID No. 2972, Seq. ID  
10 No. 2980, Seq. ID No. 2986, Seq. ID No. 2990, Seq. ID No. 2994, Seq. ID No. 3000,  
Seq. ID No. 3002, Seq. ID No. 3004, Seq. ID No. 3016, Seq. ID No. 3018, Seq. ID No.  
3020, Seq. ID No. 3022, Seq. ID No. 3034, Seq. ID No. 3036, Seq. ID No. 3038, Seq. ID  
No. 3040, Seq. ID No. 3042, Seq. ID No. 3046, Seq. ID No. 3048, Seq. ID No. 3050,  
Seq. ID No. 3052, Seq. ID No. 3054, Seq. ID No. 3058, Seq. ID No. 3060, Seq. ID No.  
15 3062, Seq. ID No. 3066, Seq. ID No. 3068, Seq. ID No. 3070, Seq. ID No. 3080, Seq. ID  
No. 3082, Seq. ID No. 3084, Seq. ID No. 3086, Seq. ID No. 3088, Seq. ID No. 3090,  
Seq. ID No. 3092, Seq. ID No. 3094, Seq. ID No. 3096, Seq. ID No. 3098, Seq. ID No.  
3100, Seq. ID No. 3102, Seq. ID No. 3104, Seq. ID No. 3106, Seq. ID No. 3108, Seq. ID  
No. 3110, Seq. ID No. 3112, Seq. ID No. 3114, Seq. ID No. 3116, Seq. ID No. 3118,  
20 Seq. ID No. 3126, Seq. ID No. 3128, Seq. ID No. 3130, Seq. ID No. 3132, Seq. ID No.  
3134, Seq. ID No. 3136, Seq. ID No. 3138, Seq. ID No. 3140, Seq. ID No. 3142, Seq. ID  
No. 3144, Seq. ID No. 3148, Seq. ID No. 3150, Seq. ID No. 3152, Seq. ID No. 3154,  
Seq. ID No. 3160, Seq. ID No. 3162, Seq. ID No. 3168, Seq. ID No. 3170, Seq. ID No.  
3172, Seq. ID No. 3176, Seq. ID No. 3178, Seq. ID No. 3180, Seq. ID No. 3182, Seq. ID  
25 No. 3186, Seq. ID No. 3188, Seq. ID No. 3190, Seq. ID No. 3192, Seq. ID No. 3196,  
Seq. ID No. 3198, Seq. ID No. 3200, Seq. ID No. 3204, Seq. ID No. 3206, Seq. ID No.  
3208, Seq. ID No. 3210, Seq. ID No. 3212, Seq. ID No. 3222, Seq. ID No. 3224, Seq. ID  
No. 3226, Seq. ID No. 3228, Seq. ID No. 3230, Seq. ID No. 3232, Seq. ID No. 3234,  
Seq. ID No. 3236, Seq. ID No. 3238, Seq. ID No. 3240, Seq. ID No. 3248, Seq. ID No.  
30 3252, Seq. ID No. 3254, Seq. ID No. 3260, Seq. ID No. 3266, Seq. ID No. 3268, Seq. ID  
No. 3272, Seq. ID No. 3274, Seq. ID No. 3280, Seq. ID No. 3282, Seq. ID No. 3284,  
Seq. ID No. 3286, Seq. ID No. 3288, Seq. ID No. 3290, Seq. ID No. 3292, Seq. ID No.  
3294, Seq. ID No. 3296, Seq. ID No. 3300, Seq. ID No. 3302, Seq. ID No. 3304, Seq. ID

No. 3306, Seq. ID No. 3308, Seq. ID No. 3310, Seq. ID No. 3312, Seq. ID No. 3314,  
Seq. ID No. 3316, Seq. ID No. 3320, Seq. ID No. 3322, Seq. ID No. 3328, Seq. ID No.  
3330, Seq. ID No. 3334, Seq. ID No. 3342, Seq. ID No. 3344, Seq. ID No. 3346, Seq. ID  
No. 3348, Seq. ID No. 3362, Seq. ID No. 3364, Seq. ID No. 3366, Seq. ID No. 3368,  
5 Seq. ID No. 3370, Seq. ID No. 3372, Seq. ID No. 3374, Seq. ID No. 3380, Seq. ID No.  
3382, Seq. ID No. 3384, Seq. ID No. 3386, Seq. ID No. 3388, Seq. ID No. 3394, Seq. ID  
No. 3398, Seq. ID No. 3400, Seq. ID No. 3402, Seq. ID No. 3404, Seq. ID No. 3408,  
Seq. ID No. 3410, Seq. ID No. 3412, Seq. ID No. 3414, Seq. ID No. 3418, Seq. ID No.  
3420, Seq. ID No. 3424, Seq. ID No. 3430, Seq. ID No. 3432, Seq. ID No. 3436, Seq. ID  
10 No. 3438, Seq. ID No. 3440, Seq. ID No. 3444, Seq. ID No. 3446, Seq. ID No. 3448,  
Seq. ID No. 3460, Seq. ID No. 3462, Seq. ID No. 3466, Seq. ID No. 3468, Seq. ID No.  
3470, Seq. ID No. 3472, Seq. ID No. 3474, Seq. ID No. 3476, Seq. ID No. 3478, Seq. ID  
No. 3480, Seq. ID No. 3484, Seq. ID No. 3486, Seq. ID No. 3488, Seq. ID No. 3490,  
Seq. ID No. 3496, Seq. ID No. 3498, Seq. ID No. 3500, Seq. ID No. 3502, Seq. ID No.  
15 3508, Seq. ID No. 3510, Seq. ID No. 3512, Seq. ID No. 3514, Seq. ID No. 3516, Seq. ID  
No. 3522, Seq. ID No. 3524, Seq. ID No. 3526, Seq. ID No. 3530, Seq. ID No. 3534,  
Seq. ID No. 3536, Seq. ID No. 3538, Seq. ID No. 3542, Seq. ID No. 3544, Seq. ID No.  
3546, Seq. ID No. 3548, Seq. ID No. 3550, Seq. ID No. 3552, Seq. ID No. 3554, Seq. ID  
No. 3556, Seq. ID No. 3558, Seq. ID No. 3560, Seq. ID No. 3564, Seq. ID No. 3566,  
20 Seq. ID No. 3568, Seq. ID No. 3570, Seq. ID No. 3572, Seq. ID No. 3576, Seq. ID No.  
3578, Seq. ID No. 3580, Seq. ID No. 3584, Seq. ID No. 3586, Seq. ID No. 3590, Seq. ID  
No. 3592, Seq. ID No. 3598, Seq. ID No. 3600, Seq. ID No. 3602, Seq. ID No. 3604,  
Seq. ID No. 3606, Seq. ID No. 3608, Seq. ID No. 3610, Seq. ID No. 3614, Seq. ID No.  
3616, Seq. ID No. 3624, Seq. ID No. 3628, Seq. ID No. 3632, Seq. ID No. 3634, Seq. ID  
25 No. 3638, Seq. ID No. 3640, Seq. ID No. 3642, Seq. ID No. 3644, Seq. ID No. 3646,  
Seq. ID No. 3648, Seq. ID No. 3650, Seq. ID No. 3652, Seq. ID No. 3654, Seq. ID No.  
3656, Seq. ID No. 3658, Seq. ID No. 3660, Seq. ID No. 3662, Seq. ID No. 3664, Seq. ID  
No. 3666, Seq. ID No. 3668, Seq. ID No. 3670, Seq. ID No. 3672, Seq. ID No. 3674,  
Seq. ID No. 3676, Seq. ID No. 3682, Seq. ID No. 3684, Seq. ID No. 3686, Seq. ID No.  
30 3688, Seq. ID No. 3692, Seq. ID No. 3694, Seq. ID No. 3696, Seq. ID No. 3698, Seq. ID  
No. 3700, Seq. ID No. 3702, Seq. ID No. 3704, Seq. ID No. 3706, Seq. ID No. 3708,  
Seq. ID No. 3710, Seq. ID No. 3712, Seq. ID No. 3714, Seq. ID No. 3716, Seq. ID No.  
3720, Seq. ID No. 3722, Seq. ID No. 3726, Seq. ID No. 3730, Seq. ID No. 3732, Seq. ID

No. 3734, Seq. ID No. 3736, Seq. ID No. 3738, Seq. ID No. 3740, Seq. ID No. 3744,  
Seq. ID No. 3748, Seq. ID No. 3750, Seq. ID No. 3752, Seq. ID No. 3760, Seq. ID No.  
3768, Seq. ID No. 3770, Seq. ID No. 3772, Seq. ID No. 3774, Seq. ID No. 3776, Seq. ID  
No. 3778, Seq. ID No. 3780, Seq. ID No. 3786, Seq. ID No. 3788, Seq. ID No. 3790,  
5 Seq. ID No. 3792, Seq. ID No. 3796, Seq. ID No. 3798, Seq. ID No. 3802, Seq. ID No.  
3804, Seq. ID No. 3806, Seq. ID No. 3810, Seq. ID No. 3812, Seq. ID No. 3820, Seq. ID  
No. 3822, Seq. ID No. 3824, Seq. ID No. 3826, Seq. ID No. 3828, Seq. ID No. 3830,  
Seq. ID No. 3832, Seq. ID No. 3834, Seq. ID No. 3836, Seq. ID No. 3842, Seq. ID No.  
3844, Seq. ID No. 3846, Seq. ID No. 3848, Seq. ID No. 3856, Seq. ID No. 3858, Seq. ID  
10 No. 3868, Seq. ID No. 3870, Seq. ID No. 3872, Seq. ID No. 3874, Seq. ID No. 3876,  
Seq. ID No. 3878, Seq. ID No. 3882, Seq. ID No. 3884, Seq. ID No. 3886, Seq. ID No.  
3888, Seq. ID No. 3894, Seq. ID No. 3898, Seq. ID No. 3900, Seq. ID No. 3902, Seq. ID  
No. 3906, Seq. ID No. 3908, Seq. ID No. 3910, Seq. ID No. 3912, Seq. ID No. 3914,  
Seq. ID No. 3918, Seq. ID No. 3920, Seq. ID No. 3922, Seq. ID No. 3928, Seq. ID No.  
15 3930, Seq. ID No. 3932, Seq. ID No. 3934, Seq. ID No. 3936, Seq. ID No. 3938, Seq. ID  
No. 3940, Seq. ID No. 3942, Seq. ID No. 3944, Seq. ID No. 3946, Seq. ID No. 3948,  
Seq. ID No. 3950, Seq. ID No. 3952, Seq. ID No. 3954, Seq. ID No. 3956, Seq. ID No.  
3958, Seq. ID No. 3962, Seq. ID No. 3966, Seq. ID No. 3968, Seq. ID No. 3970, Seq. ID  
No. 3972, Seq. ID No. 3978, Seq. ID No. 3980, Seq. ID No. 3982, Seq. ID No. 3984,  
20 Seq. ID No. 3986, Seq. ID No. 3988, Seq. ID No. 3990, Seq. ID No. 3992, Seq. ID No.  
4000, Seq. ID No. 4002, Seq. ID No. 4004, Seq. ID No. 4012, Seq. ID No. 4014, Seq. ID  
No. 4016, Seq. ID No. 4018, Seq. ID No. 4020, Seq. ID No. 4022, Seq. ID No. 4024,  
Seq. ID No. 4030, Seq. ID No. 4032, Seq. ID No. 4034, Seq. ID No. 4036, Seq. ID No.  
4038, Seq. ID No. 4052, Seq. ID No. 4054, Seq. ID No. 4056, Seq. ID No. 4058, Seq. ID  
25 No. 4060, Seq. ID No. 4064, Seq. ID No. 4066, Seq. ID No. 4068, Seq. ID No. 4070,  
Seq. ID No. 4076, Seq. ID No. 4078, Seq. ID No. 4086, Seq. ID No. 4088, Seq. ID No.  
4090, Seq. ID No. 4092, Seq. ID No. 4094, Seq. ID No. 4096, Seq. ID No. 4098, Seq. ID  
No. 4100, Seq. ID No. 4106, Seq. ID No. 4108, Seq. ID No. 4110, Seq. ID No. 4114,  
Seq. ID No. 4116, Seq. ID No. 4118, Seq. ID No. 4120, Seq. ID No. 4122, Seq. ID No.  
30 4124, Seq. ID No. 4126, Seq. ID No. 4128, Seq. ID No. 4130, Seq. ID No. 4132, Seq. ID  
No. 4148, Seq. ID No. 4150, Seq. ID No. 4156, Seq. ID No. 4158, Seq. ID No. 4160,  
Seq. ID No. 4162, Seq. ID No. 4164, Seq. ID No. 4166, Seq. ID No. 4168, Seq. ID No.  
4170, Seq. ID No. 4172, Seq. ID No. 4174, Seq. ID No. 4176, Seq. ID No. 4178, Seq. ID

No. 4180, Seq. ID No. 4184, Seq. ID No. 4186, Seq. ID No. 4188, Seq. ID No. 4190,  
Seq. ID No. 4192, Seq. ID No. 4194, Seq. ID No. 4196, Seq. ID No. 4198, Seq. ID No.  
4200, Seq. ID No. 4202, Seq. ID No. 4204, Seq. ID No. 4206, Seq. ID No. 4208, Seq. ID  
No. 4210, Seq. ID No. 4212, Seq. ID No. 4214, Seq. ID No. 4216, Seq. ID No. 4218,  
5 Seq. ID No. 4220, Seq. ID No. 4230, Seq. ID No. 4236, Seq. ID No. 4238, Seq. ID No.  
4240, Seq. ID No. 4244, Seq. ID No. 4246, Seq. ID No. 4250, Seq. ID No. 4252, Seq. ID  
No. 4256, Seq. ID No. 4268, Seq. ID No. 4272, Seq. ID No. 4274, Seq. ID No. 4278,  
Seq. ID No. 4280, Seq. ID No. 4282, Seq. ID No. 4284, Seq. ID No. 4290, Seq. ID No.  
4292, Seq. ID No. 4294, Seq. ID No. 4296, Seq. ID No. 4300, Seq. ID No. 4302, Seq. ID  
10 No. 4304, Seq. ID No. 4306, Seq. ID No. 4310, Seq. ID No. 4316, Seq. ID No. 4318,  
Seq. ID No. 4320, Seq. ID No. 4322, Seq. ID No. 4324, Seq. ID No. 4326, Seq. ID No.  
4328, Seq. ID No. 4330, Seq. ID No. 4332, Seq. ID No. 4334, Seq. ID No. 4336, Seq. ID  
No. 4338, Seq. ID No. 4340, Seq. ID No. 4342, Seq. ID No. 4346, Seq. ID No. 4348,  
Seq. ID No. 4350, Seq. ID No. 4352, Seq. ID No. 4354, Seq. ID No. 4356, Seq. ID No.  
15 4358, Seq. ID No. 4360, Seq. ID No. 4362, Seq. ID No. 4364, Seq. ID No. 4366, Seq. ID  
No. 4368, Seq. ID No. 4370, Seq. ID No. 4372, Seq. ID No. 4374, Seq. ID No. 4376,  
Seq. ID No. 4378, Seq. ID No. 4382, Seq. ID No. 4384, Seq. ID No. 4388, Seq. ID No.  
4394, Seq. ID No. 4396, Seq. ID No. 4398, Seq. ID No. 4402, Seq. ID No. 4406, Seq. ID  
No. 4408, Seq. ID No. 4410, Seq. ID No. 4412, Seq. ID No. 4414, Seq. ID No. 4416,  
20 Seq. ID No. 4418, Seq. ID No. 4420, Seq. ID No. 4422, Seq. ID No. 4424, Seq. ID No.  
4426, Seq. ID No. 4428, Seq. ID No. 4430, Seq. ID No. 4432, Seq. ID No. 4434, Seq. ID  
No. 4436, Seq. ID No. 4444, Seq. ID No. 4446, Seq. ID No. 4448, Seq. ID No. 4450,  
Seq. ID No. 4452, Seq. ID No. 4454, Seq. ID No. 4456, Seq. ID No. 4458, Seq. ID No.  
4460, Seq. ID No. 4462, Seq. ID No. 4464, Seq. ID No. 4466, Seq. ID No. 4468, Seq. ID  
25 No. 4472, Seq. ID No. 4476, Seq. ID No. 4478, Seq. ID No. 4480, Seq. ID No. 4488,  
Seq. ID No. 4490, Seq. ID No. 4492, Seq. ID No. 4500, Seq. ID No. 4502, Seq. ID No.  
4504, Seq. ID No. 4506, Seq. ID No. 4508, Seq. ID No. 4510, Seq. ID No. 4512, Seq. ID  
No. 4518, Seq. ID No. 4520, Seq. ID No. 4522, Seq. ID No. 4524, Seq. ID No. 4526,  
Seq. ID No. 4532, Seq. ID No. 4536, Seq. ID No. 4538, Seq. ID No. 4540, Seq. ID No.  
30 4542, Seq. ID No. 4544, Seq. ID No. 4546, Seq. ID No. 4548, Seq. ID No. 4550, Seq. ID  
No. 4552, Seq. ID No. 4554, Seq. ID No. 4556, Seq. ID No. 4558, Seq. ID No. 4560,  
Seq. ID No. 4562, Seq. ID No. 4564, Seq. ID No. 4566, Seq. ID No. 4568, Seq. ID No.  
4570, Seq. ID No. 4572, Seq. ID No. 4574, Seq. ID No. 4576, Seq. ID No. 4578, Seq. ID

No. 4580, Seq. ID No. 4582, Seq. ID No. 4584, Seq. ID No. 4586, Seq. ID No. 4592,  
Seq. ID No. 4594, Seq. ID No. 4596, Seq. ID No. 4598, Seq. ID No. 4600, Seq. ID No.  
4602, Seq. ID No. 4604, Seq. ID No. 4606, Seq. ID No. 4608, Seq. ID No. 4610, Seq. ID  
No. 4612, Seq. ID No. 4614, Seq. ID No. 4616, Seq. ID No. 4618, Seq. ID No. 4620,  
5 Seq. ID No. 4622, Seq. ID No. 4624, Seq. ID No. 4626, Seq. ID No. 4628, Seq. ID No.  
4630, Seq. ID No. 4632, Seq. ID No. 4634, Seq. ID No. 4636, Seq. ID No. 4638, Seq. ID  
No. 4646, Seq. ID No. 4648, Seq. ID No. 4650, Seq. ID No. 4652, Seq. ID No. 4654,  
Seq. ID No. 4656, Seq. ID No. 4658, Seq. ID No. 4662, Seq. ID No. 4664, Seq. ID No.  
4666, Seq. ID No. 4668, Seq. ID No. 4670, Seq. ID No. 4672, Seq. ID No. 4674, Seq. ID  
10 No. 4676, Seq. ID No. 4678, Seq. ID No. 4680, Seq. ID No. 4684, Seq. ID No. 4686,  
Seq. ID No. 4690, Seq. ID No. 4692, Seq. ID No. 4694, Seq. ID No. 4698, Seq. ID No.  
4700, Seq. ID No. 4702, Seq. ID No. 4704, Seq. ID No. 4714, Seq. ID No. 4720, Seq. ID  
No. 4722, Seq. ID No. 4724, Seq. ID No. 4726, Seq. ID No. 4728, Seq. ID No. 4730,  
Seq. ID No. 4732, Seq. ID No. 4734, Seq. ID No. 4736, Seq. ID No. 4740, Seq. ID No.  
15 4742, Seq. ID No. 4744, Seq. ID No. 4746, Seq. ID No. 4748, Seq. ID No. 4750, Seq. ID  
No. 4752, Seq. ID No. 4754, Seq. ID No. 4756, Seq. ID No. 4758, Seq. ID No. 4762,  
Seq. ID No. 4764, Seq. ID No. 4766, Seq. ID No. 4768, Seq. ID No. 4770, Seq. ID No.  
4772, Seq. ID No. 4774, Seq. ID No. 4776, Seq. ID No. 4778, Seq. ID No. 4780, Seq. ID  
No. 4782, Seq. ID No. 4784, Seq. ID No. 4786, Seq. ID No. 4788, Seq. ID No. 4790,  
20 Seq. ID No. 4792, Seq. ID No. 4794, Seq. ID No. 4796, Seq. ID No. 4798, Seq. ID No.  
4800, Seq. ID No. 4802, Seq. ID No. 4804, Seq. ID No. 4806, Seq. ID No. 4808, Seq. ID  
No. 4810, Seq. ID No. 4812, Seq. ID No. 4816, Seq. ID No. 4818, Seq. ID No. 4820,  
Seq. ID No. 4822, Seq. ID No. 4824, Seq. ID No. 4826, Seq. ID No. 4830, Seq. ID No.  
4832, Seq. ID No. 4834, Seq. ID No. 4836, Seq. ID No. 4838, Seq. ID No. 4840, Seq. ID  
25 No. 4842, Seq. ID No. 4844, Seq. ID No. 4846, Seq. ID No. 4848, Seq. ID No. 4850,  
Seq. ID No. 4852, Seq. ID No. 4856, Seq. ID No. 4858, Seq. ID No. 4860, Seq. ID No.  
4862, Seq. ID No. 4866, Seq. ID No. 4868, Seq. ID No. 4878, Seq. ID No. 4880, Seq. ID  
No. 4882, Seq. ID No. 4884, Seq. ID No. 4886, Seq. ID No. 4888, Seq. ID No. 4890,  
Seq. ID No. 4892, Seq. ID No. 4894, Seq. ID No. 4896, Seq. ID No. 4898, Seq. ID No.  
30 4900, Seq. ID No. 4902, Seq. ID No. 4904, Seq. ID No. 4906, Seq. ID No. 4908, Seq. ID  
No. 4910, Seq. ID No. 4912, Seq. ID No. 4914, Seq. ID No. 4916, Seq. ID No. 4918,  
Seq. ID No. 4926, Seq. ID No. 4928, Seq. ID No. 4934, Seq. ID No. 4936, Seq. ID No.  
4938, Seq. ID No. 4940, Seq. ID No. 4942, Seq. ID No. 4944, Seq. ID No. 4946, Seq. ID

No. 4948, Seq. ID No. 4954, Seq. ID No. 4956, Seq. ID No. 4958, Seq. ID No. 4960, Seq. ID No. 4962, Seq. ID No. 4964, Seq. ID No. 4966, Seq. ID No. 4968, Seq. ID No. 4970, Seq. ID No. 4972, Seq. ID No. 4974, Seq. ID No. 4978, Seq. ID No. 4980, Seq. ID No. 4982, Seq. ID No. 4984, Seq. ID No. 4986, Seq. ID No. 4990, Seq. ID No. 4992, Seq. ID No. 4994, Seq. ID No. 4996, Seq. ID No. 4998, Seq. ID No. 5002, Seq. ID No. 5004, Seq. ID No. 5006, Seq. ID No. 5008, Seq. ID No. 5010, Seq. ID No. 5012, Seq. ID No. 5016, Seq. ID No. 5018, Seq. ID No. 5020, Seq. ID No. 5022, Seq. ID No. 5024, Seq. ID No. 5026, Seq. ID No. 5028, Seq. ID No. 5030, Seq. ID No. 5034, Seq. ID No. 5036, Seq. ID No. 5038, Seq. ID No. 5040, Seq. ID No. 5042, Seq. ID No. 5044, Seq. ID No. 5046, Seq. ID No. 5048, Seq. ID No. 5050, Seq. ID No. 5052, Seq. ID No. 5054, Seq. ID No. 5056, Seq. ID No. 5058, Seq. ID No. 5060, Seq. ID No. 5066, Seq. ID No. 5068, Seq. ID No. 5072, Seq. ID No. 5074, Seq. ID No. 5076, Seq. ID No. 5078, Seq. ID No. 5080, Seq. ID No. 5082, Seq. ID No. 5084, Seq. ID No. 5088, Seq. ID No. 5090, Seq. ID No. 5092, Seq. ID No. 5094, Seq. ID No. 5096, Seq. ID No. 5098, Seq. ID No. 5100, Seq. ID No. 5102, Seq. ID No. 5106, Seq. ID No. 5108, Seq. ID No. 5110, Seq. ID No. 5112, Seq. ID No. 5114, Seq. ID No. 5118, Seq. ID No. 5120, Seq. ID No. 5122, Seq. ID No. 5128, Seq. ID No. 5144, Seq. ID No. 5146, Seq. ID No. 5148, Seq. ID No. 5150, Seq. ID No. 5152, Seq. ID No. 5154, Seq. ID No. 5156, Seq. ID No. 5158, Seq. ID No. 5162, Seq. ID No. 5164, Seq. ID No. 5168, Seq. ID No. 5170, Seq. ID No. 5172, Seq. ID No. 5174, Seq. ID No. 5178, Seq. ID No. 5180, Seq. ID No. 5182, Seq. ID No. 5184, Seq. ID No. 5186, Seq. ID No. 5188, Seq. ID No. 5190, Seq. ID No. 5192, Seq. ID No. 5194, Seq. ID No. 5196, Seq. ID No. 5202, Seq. ID No. 5204, Seq. ID No. 5210, Seq. ID No. 5212, Seq. ID No. 5216, Seq. ID No. 5218, Seq. ID No. 5222, Seq. ID No. 5226, Seq. ID No. 5228, Seq. ID No. 5230, Seq. ID No. 5232, Seq. ID No. 5234, Seq. ID No. 5236, Seq. ID No. 5238, Seq. ID No. 5240, Seq. ID No. 5242, Seq. ID No. 5244, Seq. ID No. 5246, Seq. ID No. 5248, Seq. ID No. 5250, Seq. ID No. 5252, Seq. ID No. 5254, Seq. ID No. 5256, Seq. ID No. 5258, Seq. ID No. 5260, Seq. ID No. 5262, Seq. ID No. 5264, Seq. ID No. 5266, Seq. ID No. 5270, Seq. ID No. 5272, Seq. ID No. 5284, Seq. ID No. 5288, Seq. ID No. 5290, Seq. ID No. 5292, Seq. ID No. 5294, Seq. ID No. 5296, Seq. ID No. 5298, Seq. ID No. 5300, Seq. ID No. 5302, Seq. ID No. 5304, Seq. ID No. 5306, Seq. ID No. 5308, Seq. ID No. 5310, Seq. ID No. 5312, Seq. ID No. 5314, Seq. ID No. 5316, Seq. ID No. 5318, Seq. ID No. 5320, Seq. ID No. 5322, Seq. ID No. 5324, Seq. ID No. 5326, Seq. ID No. 5334, Seq. ID No. 5336, Seq. ID No. 5338, Seq. ID

No. 5340, Seq. ID No. 5344, Seq. ID No. 5346, Seq. ID No. 5348, Seq. ID No. 5350,  
Seq. ID No. 5352, Seq. ID No. 5354, Seq. ID No. 5356, Seq. ID No. 5358, Seq. ID No.  
5360, Seq. ID No. 5362, Seq. ID No. 5364, Seq. ID No. 5366, Seq. ID No. 5368, Seq. ID  
No. 5370, Seq. ID No. 5372, Seq. ID No. 5374, Seq. ID No. 5376, Seq. ID No. 5382,  
5 Seq. ID No. 5384, Seq. ID No. 5390, Seq. ID No. 5392, Seq. ID No. 5394, Seq. ID No.  
5396, Seq. ID No. 5398, Seq. ID No. 5400, Seq. ID No. 5402, Seq. ID No. 5404, Seq. ID  
No. 5408, Seq. ID No. 5410, Seq. ID No. 5412, Seq. ID No. 5418, Seq. ID No. 5420,  
Seq. ID No. 5422, Seq. ID No. 5424, Seq. ID No. 5426, Seq. ID No. 5428, Seq. ID No.  
5430, Seq. ID No. 5432, Seq. ID No. 5436, Seq. ID No. 5438, Seq. ID No. 5440, Seq. ID  
10 No. 5442, Seq. ID No. 5444, Seq. ID No. 5446, Seq. ID No. 5448, Seq. ID No. 5450,  
Seq. ID No. 5452, Seq. ID No. 5456, Seq. ID No. 5458, Seq. ID No. 5468, Seq. ID No.  
5470, Seq. ID No. 5472, Seq. ID No. 5474, Seq. ID No. 5476, Seq. ID No. 5478, Seq. ID  
No. 5480, Seq. ID No. 5482, Seq. ID No. 5484, Seq. ID No. 5486, Seq. ID No. 5488,  
Seq. ID No. 5490, Seq. ID No. 5494, Seq. ID No. 5496, Seq. ID No. 5500, Seq. ID No.  
15 5502, Seq. ID No. 5504, Seq. ID No. 5506, Seq. ID No. 5508, Seq. ID No. 5512, Seq. ID  
No. 5520, Seq. ID No. 5522, Seq. ID No. 5524, Seq. ID No. 5528, Seq. ID No. 5536,  
Seq. ID No. 5538, Seq. ID No. 5540, Seq. ID No. 5542, Seq. ID No. 5548, Seq. ID No.  
5550, Seq. ID No. 5552, Seq. ID No. 5554, Seq. ID No. 5556, Seq. ID No. 5558, Seq. ID  
No. 5560, Seq. ID No. 5562, Seq. ID No. 5564, Seq. ID No. 5566, Seq. ID No. 5568,  
20 Seq. ID No. 5572, Seq. ID No. 5574, Seq. ID No. 5576, Seq. ID No. 5578, Seq. ID No.  
5580, Seq. ID No. 5582, Seq. ID No. 5584, Seq. ID No. 5586, Seq. ID No. 5600, Seq. ID  
No. 5602, Seq. ID No. 5604, Seq. ID No. 5606, Seq. ID No. 5608, Seq. ID No. 5614,  
Seq. ID No. 5616, Seq. ID No. 5618, Seq. ID No. 5620, Seq. ID No. 5628, Seq. ID No.  
5630, Seq. ID No. 5632, Seq. ID No. 5636, Seq. ID No. 5646, Seq. ID No. 5648, Seq. ID  
25 No. 5652, Seq. ID No. 5654, Seq. ID No. 5656, Seq. ID No. 5658, Seq. ID No. 5662,  
Seq. ID No. 5664, Seq. ID No. 5666, Seq. ID No. 5670, Seq. ID No. 5672, Seq. ID No.  
5674, Seq. ID No. 5676, Seq. ID No. 5678, Seq. ID No. 5680, Seq. ID No. 5692, Seq. ID  
No. 5694, Seq. ID No. 5696, Seq. ID No. 5698, Seq. ID No. 5702, Seq. ID No. 5708,  
Seq. ID No. 5714, Seq. ID No. 5716, Seq. ID No. 5718, Seq. ID No. 5722, Seq. ID No.  
30 5724, Seq. ID No. 5726, Seq. ID No. 5728, Seq. ID No. 5732, Seq. ID No. 5738, Seq. ID  
No. 5742, Seq. ID No. 5744, Seq. ID No. 5746, Seq. ID No. 5748, Seq. ID No. 5750,  
Seq. ID No. 5752, Seq. ID No. 5754, Seq. ID No. 5756, Seq. ID No. 5758, Seq. ID No.  
5760, Seq. ID No. 5762, Seq. ID No. 5770, Seq. ID No. 5774, Seq. ID No. 5776, Seq. ID

No. 5778, Seq. ID No. 5780, Seq. ID No. 5782, Seq. ID No. 5788, Seq. ID No. 5790,  
Seq. ID No. 5794, Seq. ID No. 5796, Seq. ID No. 5800, Seq. ID No. 5802, Seq. ID No.  
5804, Seq. ID No. 5806, Seq. ID No. 5808, Seq. ID No. 5810, Seq. ID No. 5812, Seq. ID  
No. 5814, Seq. ID No. 5816, Seq. ID No. 5818, Seq. ID No. 5820, Seq. ID No. 5822,  
5 Seq. ID No. 5824, Seq. ID No. 5826, Seq. ID No. 5828, Seq. ID No. 5832, Seq. ID No.  
5834, Seq. ID No. 5836, Seq. ID No. 5838, Seq. ID No. 5840, Seq. ID No. 5842, Seq. ID  
No. 5844, Seq. ID No. 5846, Seq. ID No. 5848, Seq. ID No. 5850, Seq. ID No. 5852,  
Seq. ID No. 5854, Seq. ID No. 5856, Seq. ID No. 5858, Seq. ID No. 5860, Seq. ID No.  
5862, Seq. ID No. 5864, Seq. ID No. 5866, Seq. ID No. 5868, Seq. ID No. 5870, Seq. ID  
10 No. 5872, Seq. ID No. 5874, Seq. ID No. 5876, Seq. ID No. 5878, Seq. ID No. 5882,  
Seq. ID No. 5888, Seq. ID No. 5892, Seq. ID No. 5898, Seq. ID No. 5904, Seq. ID No.  
5908, Seq. ID No. 5912, Seq. ID No. 5914, Seq. ID No. 5916, Seq. ID No. 5918, Seq. ID  
No. 5920, Seq. ID No. 5926, Seq. ID No. 5932, Seq. ID No. 5934, Seq. ID No. 5936,  
Seq. ID No. 5938, Seq. ID No. 5942, Seq. ID No. 5944, Seq. ID No. 5946, Seq. ID No.  
15 5948, Seq. ID No. 5950, Seq. ID No. 5952, Seq. ID No. 5954, Seq. ID No. 5956, Seq. ID  
No. 5958, Seq. ID No. 5960, Seq. ID No. 5962, Seq. ID No. 5964, Seq. ID No. 5966,  
Seq. ID No. 5968, Seq. ID No. 5970, Seq. ID No. 5972, Seq. ID No. 5974, Seq. ID No.  
5976, Seq. ID No. 5978, Seq. ID No. 5980, Seq. ID No. 5982, Seq. ID No. 5984, Seq. ID  
No. 5986, Seq. ID No. 5988, Seq. ID No. 5990, Seq. ID No. 5992, Seq. ID No. 5994,  
20 Seq. ID No. 5996, Seq. ID No. 5998, Seq. ID No. 6000, Seq. ID No. 6002, Seq. ID No.  
6004, Seq. ID No. 6006, Seq. ID No. 6008, Seq. ID No. 6010, Seq. ID No. 6012, Seq. ID  
No. 6014, Seq. ID No. 6016, Seq. ID No. 6018, Seq. ID No. 6020, Seq. ID No. 6022,  
Seq. ID No. 6030, Seq. ID No. 6032, Seq. ID No. 6034, Seq. ID No. 6036, Seq. ID No.  
6038, Seq. ID No. 6040, Seq. ID No. 6042, Seq. ID No. 6046, Seq. ID No. 6050, Seq. ID  
25 No. 6052, Seq. ID No. 6056, Seq. ID No. 6058, Seq. ID No. 6062, Seq. ID No. 6066,  
Seq. ID No. 6070, Seq. ID No. 6072, Seq. ID No. 6074, Seq. ID No. 6076, Seq. ID No.  
6078, Seq. ID No. 6080, Seq. ID No. 6082, Seq. ID No. 6084, Seq. ID No. 6086, Seq. ID  
No. 6094, Seq. ID No. 6098, Seq. ID No. 6100, Seq. ID No. 6102, Seq. ID No. 6106,  
Seq. ID No. 6114, Seq. ID No. 6120, Seq. ID No. 6122, Seq. ID No. 6124, Seq. ID No.  
30 6126, Seq. ID No. 6128, Seq. ID No. 6130, Seq. ID No. 6132, Seq. ID No. 6134, Seq. ID  
No. 6140, Seq. ID No. 6142, Seq. ID No. 6144, Seq. ID No. 6146, Seq. ID No. 6148,  
Seq. ID No. 6150, Seq. ID No. 6152, Seq. ID No. 6154, Seq. ID No. 6156, Seq. ID No.  
6158, Seq. ID No. 6168, Seq. ID No. 6172, Seq. ID No. 6174, Seq. ID No. 6176, Seq. ID



No. 6178, Seq. ID No. 6180, Seq. ID No. 6182, Seq. ID No. 6194, Seq. ID No. 6196,  
Seq. ID No. 6200, Seq. ID No. 6202, Seq. ID No. 6208, Seq. ID No. 6212, Seq. ID No.  
6214, Seq. ID No. 6216, Seq. ID No. 6220, Seq. ID No. 6232, Seq. ID No. 6234, Seq. ID  
No. 6240, Seq. ID No. 6248, Seq. ID No. 6252, Seq. ID No. 6256, Seq. ID No. 6258,  
5 Seq. ID No. 6262, Seq. ID No. 6270, Seq. ID No. 6272, Seq. ID No. 6278, Seq. ID No.  
6280, Seq. ID No. 6282, Seq. ID No. 6288, Seq. ID No. 6292, Seq. ID No. 6294, Seq. ID  
No. 6296, Seq. ID No. 6298, Seq. ID No. 6300, Seq. ID No. 6306, Seq. ID No. 6308,  
Seq. ID No. 6310, Seq. ID No. 6312, Seq. ID No. 6314, Seq. ID No. 6316, Seq. ID No.  
6318, Seq. ID No. 6320, Seq. ID No. 6322, Seq. ID No. 6324, Seq. ID No. 6330, Seq. ID  
10 No. 6332, Seq. ID No. 6334, Seq. ID No. 6336, Seq. ID No. 6338, Seq. ID No. 6340,  
Seq. ID No. 6342, Seq. ID No. 6344, Seq. ID No. 6346, Seq. ID No. 6348, Seq. ID No.  
6350, Seq. ID No. 6352, Seq. ID No. 6354, Seq. ID No. 6356, Seq. ID No. 6358, Seq. ID  
No. 6360, Seq. ID No. 6362, Seq. ID No. 6368, Seq. ID No. 6370, Seq. ID No. 6372,  
Seq. ID No. 6374, Seq. ID No. 6376, Seq. ID No. 6380, Seq. ID No. 6386, Seq. ID No.  
15 6388, Seq. ID No. 6390, Seq. ID No. 6392, Seq. ID No. 6394, Seq. ID No. 6396, Seq. ID  
No. 6398, Seq. ID No. 6400, Seq. ID No. 6402, Seq. ID No. 6404, Seq. ID No. 6406,  
Seq. ID No. 6408, Seq. ID No. 6410, Seq. ID No. 6412, Seq. ID No. 6414, Seq. ID No.  
6418, Seq. ID No. 6420, Seq. ID No. 6422, Seq. ID No. 6424, Seq. ID No. 6434, Seq. ID  
No. 6436, Seq. ID No. 6438, Seq. ID No. 6440, Seq. ID No. 6442, Seq. ID No. 6444,  
20 Seq. ID No. 6446, Seq. ID No. 6448, Seq. ID No. 6450, Seq. ID No. 6452, Seq. ID No.  
6454, Seq. ID No. 6456, Seq. ID No. 6458, Seq. ID No. 6460, Seq. ID No. 6462, Seq. ID  
No. 6464, Seq. ID No. 6466, Seq. ID No. 6468, Seq. ID No. 6470, Seq. ID No. 6472,  
Seq. ID No. 6476, Seq. ID No. 6478, Seq. ID No. 6482, Seq. ID No. 6484, Seq. ID No.  
6486, Seq. ID No. 6488, Seq. ID No. 6490, Seq. ID No. 6492, Seq. ID No. 6494, Seq. ID  
25 No. 6496, Seq. ID No. 6500, Seq. ID No. 6502, Seq. ID No. 6504, Seq. ID No. 6506,  
Seq. ID No. 6508, Seq. ID No. 6510, Seq. ID No. 6512, Seq. ID No. 6514, Seq. ID No.  
6516, Seq. ID No. 6520, Seq. ID No. 6522, Seq. ID No. 6524, Seq. ID No. 6526, Seq. ID  
No. 6528, Seq. ID No. 6530, Seq. ID No. 6532, Seq. ID No. 6534, Seq. ID No. 6536,  
Seq. ID No. 6538, Seq. ID No. 6540, Seq. ID No. 6546, Seq. ID No. 6548, Seq. ID No.  
30 6550, Seq. ID No. 6552, Seq. ID No. 6554, Seq. ID No. 6560, Seq. ID No. 6562, Seq. ID  
No. 6564, Seq. ID No. 6566, Seq. ID No. 6568, Seq. ID No. 6570, Seq. ID No. 6576,  
Seq. ID No. 6578, Seq. ID No. 6580, Seq. ID No. 6584, Seq. ID No. 6586, Seq. ID No.  
6588, Seq. ID No. 6590, Seq. ID No. 6592, Seq. ID No. 6606, Seq. ID No. 6608, Seq. ID

No. 6610, Seq. ID No. 6612, Seq. ID No. 6614, Seq. ID No. 6616, Seq. ID No. 6618, Seq. ID No. 6620, Seq. ID No. 6622, Seq. ID No. 6624, Seq. ID No. 6626, Seq. ID No. 6628, Seq. ID No. 6630, Seq. ID No. 6634, Seq. ID No. 6636, Seq. ID No. 6642, and Seq. ID No. 6648.

5 In another preferred embodiment, the polypeptide is selected from the *Alloiococcus otitidis* polypeptides identified by BlastP analysis and is selected from one of Seq. ID No. 10, Seq. ID No. 18, Seq. ID No. 46, Seq. ID No. 50, Seq. ID No. 54, Seq. ID No. 60, Seq. ID No. 90, Seq. ID No. 146, Seq. ID No. 158, Seq. ID No. 168, Seq. ID No. 172, Seq. ID No. 192, Seq. ID No. 216, Seq. ID No. 218, Seq. ID No. 226, Seq. ID  
10 No. 240, Seq. ID No. 254, Seq. ID No. 274, Seq. ID No. 278, Seq. ID No. 290, Seq. ID No. 330, Seq. ID No. 344, Seq. ID No. 346, Seq. ID No. 376, Seq. ID No. 502, Seq. ID No. 506, Seq. ID No. 512, Seq. ID No. 516, Seq. ID No. 530, Seq. ID No. 570, Seq. ID No. 576, Seq. ID No. 594, Seq. ID No. 596, Seq. ID No. 638, Seq. ID No. 660, Seq. ID No. 670, Seq. ID No. 676, Seq. ID No. 682, Seq. ID No. 730, Seq. ID No. 780, Seq. ID  
15 No. 820, Seq. ID No. 896, Seq. ID No. 922, Seq. ID No. 936, Seq. ID No. 956, Seq. ID No. 968, Seq. ID No. 986, Seq. ID No. 1018, Seq. ID No. 1040, Seq. ID No. 1076, Seq. ID No. 1090, Seq. ID No. 1138, Seq. ID No. 1224, Seq. ID No. 1242, Seq. ID No. 1316, Seq. ID No. 1332, Seq. ID No. 1370, Seq. ID No. 1460, Seq. ID No. 1518, Seq. ID No. 1562, Seq. ID No. 1564, Seq. ID No. 1568, Seq. ID No. 1572, Seq. ID No. 1574, Seq. ID  
20 No. 1602, Seq. ID No. 1608, Seq. ID No. 1614, Seq. ID No. 1620, Seq. ID No. 1642, Seq. ID No. 1648, Seq. ID No. 1654, Seq. ID No. 1658, Seq. ID No. 1666, Seq. ID No. 1700, Seq. ID No. 1714, Seq. ID No. 1752, Seq. ID No. 1772, Seq. ID No. 1786, Seq. ID No. 1790, Seq. ID No. 1792, Seq. ID No. 1798, Seq. ID No. 1812, Seq. ID No. 1818, Seq. ID No. 1820, Seq. ID No. 1822, Seq. ID No. 1872, Seq. ID No. 1896, Seq. ID No.  
25 1906, Seq. ID No. 1914, Seq. ID No. 1920, Seq. ID No. 1924, Seq. ID No. 1966, Seq. ID No. 1972, Seq. ID No. 2000, Seq. ID No. 2048, Seq. ID No. 2056, Seq. ID No. 2092, Seq. ID No. 2094, Seq. ID No. 2116, Seq. ID No. 2120, Seq. ID No. 2128, Seq. ID No. 2166, Seq. ID No. 2180, Seq. ID No. 2208, Seq. ID No. 2224, Seq. ID No. 2228, Seq. ID No. 2242, Seq. ID No. 2254, Seq. ID No. 2264, Seq. ID No. 2270, Seq. ID No. 2276,  
30 Seq. ID No. 2302, Seq. ID No. 2316, Seq. ID No. 2330, Seq. ID No. 2334, Seq. ID No. 2344, Seq. ID No. 2346, Seq. ID No. 2364, Seq. ID No. 2374, Seq. ID No. 2392, Seq. ID No. 2418, Seq. ID No. 2430, Seq. ID No. 2466, Seq. ID No. 2476, Seq. ID No. 2484, Seq. ID No. 2514, Seq. ID No. 2526, Seq. ID No. 2590, Seq. ID No. 2614, Seq. ID No.

2652, Seq. ID No. 2670, Seq. ID No. 2678, Seq. ID No. 2688, Seq. ID No. 2690, Seq. ID  
No. 2694, Seq. ID No. 2704, Seq. ID No. 2710, Seq. ID No. 2716, Seq. ID No. 2752,  
Seq. ID No. 2754, Seq. ID No. 2768, Seq. ID No. 2788, Seq. ID No. 2792, Seq. ID No.  
2804, Seq. ID No. 2868, Seq. ID No. 2872, Seq. ID No. 2908, Seq. ID No. 2920, Seq. ID  
5 No. 2922, Seq. ID No. 2924, Seq. ID No. 2928, Seq. ID No. 2934, Seq. ID No. 2958,  
Seq. ID No. 2980, Seq. ID No. 3000, Seq. ID No. 3006, Seq. ID No. 3020, Seq. ID No.  
3032, Seq. ID No. 3036, Seq. ID No. 3056, Seq. ID No. 3068, Seq. ID No. 3086, Seq. ID  
No. 3166, Seq. ID No. 3184, Seq. ID No. 3190, Seq. ID No. 3198, Seq. ID No. 3212,  
Seq. ID No. 3252, Seq. ID No. 3258, Seq. ID No. 3260, Seq. ID No. 3298, Seq. ID No.  
10 3320, Seq. ID No. 3324, Seq. ID No. 3336, Seq. ID No. 3338, Seq. ID No. 3356, Seq. ID  
No. 3360, Seq. ID No. 3378, Seq. ID No. 3398, Seq. ID No. 3406, Seq. ID No. 3416,  
Seq. ID No. 3426, Seq. ID No. 3428, Seq. ID No. 3462, Seq. ID No. 3464, Seq. ID No.  
3488, Seq. ID No. 3494, Seq. ID No. 3498, Seq. ID No. 3508, Seq. ID No. 3520, Seq. ID  
No. 3522, Seq. ID No. 3530, Seq. ID No. 3536, Seq. ID No. 3630, Seq. ID No. 3636,  
15 Seq. ID No. 3728, Seq. ID No. 3760, Seq. ID No. 3772, Seq. ID No. 3794, Seq. ID No.  
3840, Seq. ID No. 3852, Seq. ID No. 3864, Seq. ID No. 3866, Seq. ID No. 3884, Seq. ID  
No. 3892, Seq. ID No. 3914, Seq. ID No. 3926, Seq. ID No. 3930, Seq. ID No. 3976,  
Seq. ID No. 3982, Seq. ID No. 4028, Seq. ID No. 4040, Seq. ID No. 4062, Seq. ID No.  
4074, Seq. ID No. 4082, Seq. ID No. 4104, Seq. ID No. 4112, Seq. ID No. 4138, Seq. ID  
20 No. 4226, Seq. ID No. 4248, Seq. ID No. 4344, Seq. ID No. 4380, Seq. ID No. 4390,  
Seq. ID No. 4470, Seq. ID No. 4474, Seq. ID No. 4482, Seq. ID No. 4486, Seq. ID No.  
4494, Seq. ID No. 4530, Seq. ID No. 4644, Seq. ID No. 4706, Seq. ID No. 4714, Seq. ID  
No. 4718, Seq. ID No. 4814, Seq. ID No. 4816, Seq. ID No. 4826, Seq. ID No. 4828,  
Seq. ID No. 4834, Seq. ID No. 4838, Seq. ID No. 4852, Seq. ID No. 4864, Seq. ID No.  
25 4876, Seq. ID No. 4880, Seq. ID No. 4894, Seq. ID No. 4902, Seq. ID No. 4920, Seq. ID  
No. 4932, Seq. ID No. 4960, Seq. ID No. 4964, Seq. ID No. 4986, Seq. ID No. 5114,  
Seq. ID No. 5116, Seq. ID No. 5118, Seq. ID No. 5126, Seq. ID No. 5142, Seq. ID No.  
5184, Seq. ID No. 5202, Seq. ID No. 5206, Seq. ID No. 5214, Seq. ID No. 5220, Seq. ID  
No. 5280, Seq. ID No. 5286, Seq. ID No. 5332, Seq. ID No. 5382, Seq. ID No. 5390,  
30 Seq. ID No. 5406, Seq. ID No. 5412, Seq. ID No. 5420, Seq. ID No. 5434, Seq. ID No.  
5464, Seq. ID No. 5478, Seq. ID No. 5492, Seq. ID No. 5510, Seq. ID No. 5514, Seq. ID  
No. 5526, Seq. ID No. 5530, Seq. ID No. 5538, Seq. ID No. 5568, Seq. ID No. 5600,  
Seq. ID No. 5622, Seq. ID No. 5638, Seq. ID No. 5700, Seq. ID No. 5724, Seq. ID No.

5734, Seq. ID No. 5762, Seq. ID No. 5792, Seq. ID No. 5896, Seq. ID No. 5902, Seq. ID No. 5904, Seq. ID No. 5910, Seq. ID No. 5914, Seq. ID No. 5920, Seq. ID No. 5930, Seq. ID No. 5940, Seq. ID No. 6002, Seq. ID No. 6044, Seq. ID No. 6054, Seq. ID No. 6058, Seq. ID No. 6090, Seq. ID No. 6096, Seq. ID No. 6104, Seq. ID No. 6112, Seq. ID No. 6118, Seq. ID No. 6166, Seq. ID No. 6170, Seq. ID No. 6186, Seq. ID No. 6192, Seq. ID No. 6210, Seq. ID No. 6230, Seq. ID No. 6258, Seq. ID No. 6264, Seq. ID No. 6272, Seq. ID No. 6276, Seq. ID No. 6290, Seq. ID No. 6304, Seq. ID No. 6366, Seq. ID No. 6370, Seq. ID No. 6384, and Seq. ID No. 6416.

In another preferred embodiment, the polypeptide is selected from the *Alloiococcus otitidis* polypeptides, which have been identified by Pfam analysis, and is selected from one of Seq. ID No. 90, Seq. ID No. 146, Seq. ID No. 156, Seq. ID No. 168, Seq. ID No. 174, Seq. ID No. 192, Seq. ID No. 216, Seq. ID No. 220, Seq. ID No. 222, Seq. ID No. 224, Seq. ID No. 226, Seq. ID No. 234, Seq. ID No. 240, Seq. ID No. 252, Seq. ID No. 254, Seq. ID No. 272, Seq. ID No. 292, Seq. ID No. 332, Seq. ID No. 342, Seq. ID No. 346, Seq. ID No. 376, Seq. ID No. 502, Seq. ID No. 506, Seq. ID No. 512, Seq. ID No. 530, Seq. ID No. 568, Seq. ID No. 570, Seq. ID No. 576, Seq. ID No. 594, Seq. ID No. 596, Seq. ID No. 602, Seq. ID No. 638, Seq. ID No. 650, Seq. ID No. 662, Seq. ID No. 670, Seq. ID No. 676, Seq. ID No. 682, Seq. ID No. 684, Seq. ID No. 730, Seq. ID No. 754, Seq. ID No. 780, Seq. ID No. 828, Seq. ID No. 840, Seq. ID No. 896, Seq. ID No. 940, Seq. ID No. 970, Seq. ID No. 986, Seq. ID No. 1016, Seq. ID No. 1040, Seq. ID No. 1076, Seq. ID No. 1138, Seq. ID No. 1156, Seq. ID No. 1164, Seq. ID No. 1176, Seq. ID No. 1224, Seq. ID No. 1232, Seq. ID No. 1238, Seq. ID No. 1242, Seq. ID No. 1262, Seq. ID No. 1332, Seq. ID No. 1340, Seq. ID No. 1370, Seq. ID No. 1478, Seq. ID No. 1518, Seq. ID No. 1532, Seq. ID No. 1540, Seq. ID No. 1550, Seq. ID No. 1564, Seq. ID No. 1568, Seq. ID No. 1572, Seq. ID No. 1574, Seq. ID No. 1590, Seq. ID No. 1596, Seq. ID No. 1648, Seq. ID No. 1658, Seq. ID No. 1772, Seq. ID No. 1786, Seq. ID No. 1790, Seq. ID No. 1820, Seq. ID No. 1822, Seq. ID No. 1970, Seq. ID No. 2016, Seq. ID No. 2048, Seq. ID No. 2088, Seq. ID No. 2090, Seq. ID No. 2094, Seq. ID No. 2116, Seq. ID No. 2118, Seq. ID No. 2128, Seq. ID No. 2142, Seq. ID No. 2180, Seq. ID No. 2208, Seq. ID No. 2224, Seq. ID No. 2254, Seq. ID No. 2276, Seq. ID No. 2302, Seq. ID No. 2316, Seq. ID No. 2330, Seq. ID No. 2344, Seq. ID No. 2350, Seq. ID No. 2364, Seq. ID No. 2382, Seq. ID No. 2392, Seq. ID No. 2418, Seq. ID No. 2422, Seq. ID No. 2424, Seq. ID No. 2430, Seq. ID No. 2482, Seq. ID No. 2488, Seq. ID No.

2490, Seq. ID No. 2492, Seq. ID No. 2510, Seq. ID No. 2520, Seq. ID No. 2526, Seq. ID  
No. 2548, Seq. ID No. 2554, Seq. ID No. 2564, Seq. ID No. 2588, Seq. ID No. 2600,  
Seq. ID No. 2608, Seq. ID No. 2614, Seq. ID No. 2652, Seq. ID No. 2676, Seq. ID No.  
2682, Seq. ID No. 2688, Seq. ID No. 2694, Seq. ID No. 2700, Seq. ID No. 2704, Seq. ID  
5 No. 2710, Seq. ID No. 2712, Seq. ID No. 2728, Seq. ID No. 2754, Seq. ID No. 2820,  
Seq. ID No. 2822, Seq. ID No. 2824, Seq. ID No. 2868, Seq. ID No. 2872, Seq. ID No.  
2908, Seq. ID No. 2920, Seq. ID No. 2958, Seq. ID No. 2972, Seq. ID No. 2980, Seq. ID  
No. 3000, Seq. ID No. 3006, Seq. ID No. 3020, Seq. ID No. 3036, Seq. ID No. 3066,  
Seq. ID No. 3086, Seq. ID No. 3150, Seq. ID No. 3166, Seq. ID No. 3184, Seq. ID No.  
10 3204, Seq. ID No. 3212, Seq. ID No. 3252, Seq. ID No. 3260, Seq. ID No. 3320, Seq. ID  
No. 3324, Seq. ID No. 3336, Seq. ID No. 3338, Seq. ID No. 3348, Seq. ID No. 3360,  
Seq. ID No. 3378, Seq. ID No. 3380, Seq. ID No. 3400, Seq. ID No. 3426, Seq. ID No.  
3484, Seq. ID No. 3496, Seq. ID No. 3498, Seq. ID No. 3520, Seq. ID No. 3530, Seq. ID  
No. 3600, Seq. ID No. 3612, Seq. ID No. 3616, Seq. ID No. 3620, Seq. ID No. 3664,  
15 Seq. ID No. 3740, Seq. ID No. 3760, Seq. ID No. 3772, Seq. ID No. 3798, Seq. ID No.  
3826, Seq. ID No. 3842, Seq. ID No. 3856, Seq. ID No. 3864, Seq. ID No. 3902, Seq. ID  
No. 3930, Seq. ID No. 4016, Seq. ID No. 4018, Seq. ID No. 4056, Seq. ID No. 4076,  
Seq. ID No. 4086, Seq. ID No. 4090, Seq. ID No. 4100, Seq. ID No. 4106, Seq. ID No.  
4130, Seq. ID No. 4204, Seq. ID No. 4244, Seq. ID No. 4252, Seq. ID No. 4344, Seq. ID  
20 No. 4384, Seq. ID No. 4476, Seq. ID No. 4482, Seq. ID No. 4488, Seq. ID No. 4492,  
Seq. ID No. 4534, Seq. ID No. 4628, Seq. ID No. 4706, Seq. ID No. 4714, Seq. ID No.  
4718, Seq. ID No. 4720, Seq. ID No. 4730, Seq. ID No. 4790, Seq. ID No. 4792, Seq. ID  
No. 4794, Seq. ID No. 4804, Seq. ID No. 4814, Seq. ID No. 4816, Seq. ID No. 4826,  
Seq. ID No. 4834, Seq. ID No. 4838, Seq. ID No. 4876, Seq. ID No. 4880, Seq. ID No.  
25 4920, Seq. ID No. 4932, Seq. ID No. 4948, Seq. ID No. 4986, Seq. ID No. 5078, Seq. ID  
No. 5116, Seq. ID No. 5118, Seq. ID No. 5128, Seq. ID No. 5142, Seq. ID No. 5194,  
Seq. ID No. 5216, Seq. ID No. 5220, Seq. ID No. 5276, Seq. ID No. 5382, Seq. ID No.  
5390, Seq. ID No. 5410, Seq. ID No. 5412, Seq. ID No. 5476, Seq. ID No. 5492, Seq. ID  
No. 5514, Seq. ID No. 5520, Seq. ID No. 5526, Seq. ID No. 5530, Seq. ID No. 5538,  
30 Seq. ID No. 5558, Seq. ID No. 5582, Seq. ID No. 5600, Seq. ID No. 5638, Seq. ID No.  
5686, Seq. ID No. 5724, Seq. ID No. 5756, Seq. ID No. 5762, Seq. ID No. 5896, Seq. ID  
No. 5902, Seq. ID No. 5904, Seq. ID No. 5912, Seq. ID No. 5914, Seq. ID No. 5920,  
Seq. ID No. 5924, Seq. ID No. 5930, Seq. ID No. 6002, Seq. ID No. 6044, Seq. ID No.

6054, Seq. ID No. 6056, Seq. ID No. 6090, Seq. ID No. 6096, Seq. ID No. 6112, Seq. ID No. 6118, Seq. ID No. 6166, Seq. ID No. 6170, Seq. ID No. 6188, Seq. ID No. 6196, Seq. ID No. 6220, Seq. ID No. 6234, Seq. ID No. 6270, Seq. ID No. 6276, Seq. ID No. 6280, Seq. ID No. 6288, Seq. ID No. 6298, Seq. ID No. 6300, Seq. ID No. 6306, Seq. ID No. 6312, Seq. ID No. 6370, Seq. ID No. 6380, Seq. ID No. 6588, and Seq. ID No. 6592.

In yet another preferred embodiment, the polypeptide is selected from the *Alloiococcus otitidis* polypeptides, wherein the polypeptide is identified using proteomics methodology as sharing homology with surface exposed proteins in *Streptococcus pneumoniae*, and is selected from one of Seq. ID No. 2, Seq. ID No. 6, Seq. ID No. 94, Seq. ID No. 96, Seq. ID No. 104, Seq. ID No. 108, Seq. ID No. 158, Seq. ID No. 224, Seq. ID No. 226, Seq. ID No. 234, Seq. ID No. 240, Seq. ID No. 254, Seq. ID No. 318, Seq. ID No. 322, Seq. ID No. 342, Seq. ID No. 346, Seq. ID No. 354, Seq. ID No. 362, Seq. ID No. 364, Seq. ID No. 366, Seq. ID No. 376, Seq. ID No. 380, Seq. ID No. 384, Seq. ID No. 390, Seq. ID No. 392, Seq. ID No. 398, Seq. ID No. 406, Seq. ID No. 410, Seq. ID No. 416, Seq. ID No. 424, Seq. ID No. 426, Seq. ID No. 428, Seq. ID No. 430, Seq. ID No. 436, Seq. ID No. 438, Seq. ID No. 440, Seq. ID No. 442, Seq. ID No. 444, Seq. ID No. 446, Seq. ID No. 448, Seq. ID No. 450, Seq. ID No. 462, Seq. ID No. 464, Seq. ID No. 466, Seq. ID No. 514, Seq. ID No. 544, Seq. ID No. 552, Seq. ID No. 554, Seq. ID No. 560, Seq. ID No. 596, Seq. ID No. 602, Seq. ID No. 638, Seq. ID No. 650, Seq. ID No. 658, Seq. ID No. 670, Seq. ID No. 676, Seq. ID No. 684, Seq. ID No. 754, Seq. ID No. 930, Seq. ID No. 970, Seq. ID No. 1042, Seq. ID No. 1044, Seq. ID No. 1086, Seq. ID No. 1090, Seq. ID No. 1094, Seq. ID No. 1098, Seq. ID No. 1100, Seq. ID No. 1102, Seq. ID No. 1176, Seq. ID No. 1206, Seq. ID No. 1238, Seq. ID No. 1460, Seq. ID No. 1496, Seq. ID No. 1498, Seq. ID No. 1504, Seq. ID No. 1518, Seq. ID No. 1528, Seq. ID No. 1532, Seq. ID No. 1540, Seq. ID No. 1544, Seq. ID No. 1550, Seq. ID No. 1574, Seq. ID No. 1658, Seq. ID No. 1710, Seq. ID No. 1768, Seq. ID No. 1786, Seq. ID No. 1822, Seq. ID No. 1890, Seq. ID No. 1926, Seq. ID No. 1970, Seq. ID No. 2004, Seq. ID No. 2048, Seq. ID No. 2076, Seq. ID No. 2090, Seq. ID No. 2094, Seq. ID No. 2118, Seq. ID No. 2138, Seq. ID No. 2144, Seq. ID No. 2206, Seq. ID No. 2236, Seq. ID No. 2258, Seq. ID No. 2302, Seq. ID No. 2364, Seq. ID No. 2424, Seq. ID No. 2446, Seq. ID No. 2452, Seq. ID No. 2482, Seq. ID No. 2496, Seq. ID No. 2506, Seq. ID No. 2578, Seq. ID No. 2588, Seq. ID No. 2614, Seq. ID No. 2634, Seq. ID No. 2652, Seq. ID No. 2666, Seq. ID No. 2670, Seq. ID No. 2678, Seq. ID No. 2688, Seq. ID No.

2694, Seq. ID No. 2700, Seq. ID No. 2712, Seq. ID No. 2716, Seq. ID No. 2758, Seq. ID No. 2792, Seq. ID No. 2794, Seq. ID No. 2804, Seq. ID No. 2868, Seq. ID No. 2920, Seq. ID No. 2930, Seq. ID No. 3006, Seq. ID No. 3020, Seq. ID No. 3126, Seq. ID No. 3138, Seq. ID No. 3162, Seq. ID No. 3180, Seq. ID No. 3252, Seq. ID No. 3260, Seq. ID No. 3286, Seq. ID No. 3310, Seq. ID No. 3318, Seq. ID No. 3338, Seq. ID No. 3346, Seq. ID No. 3360, Seq. ID No. 3476, Seq. ID No. 3516, Seq. ID No. 3522, Seq. ID No. 3642, Seq. ID No. 3696, Seq. ID No. 3794, Seq. ID No. 3902, Seq. ID No. 3928, Seq. ID No. 3988, Seq. ID No. 4002, Seq. ID No. 4058, Seq. ID No. 4082, Seq. ID No. 4112, Seq. ID No. 4126, Seq. ID No. 4194, Seq. ID No. 4196, Seq. ID No. 4238, Seq. ID No. 4248, Seq. ID No. 4384, Seq. ID No. 4394, Seq. ID No. 4398, Seq. ID No. 4402, Seq. ID No. 4436, Seq. ID No. 4450, Seq. ID No. 4472, Seq. ID No. 4492, Seq. ID No. 4512, Seq. ID No. 4520, Seq. ID No. 4532, Seq. ID No. 4550, Seq. ID No. 4578, Seq. ID No. 4582, Seq. ID No. 4586, Seq. ID No. 4610, Seq. ID No. 4612, Seq. ID No. 4614, Seq. ID No. 4676, Seq. ID No. 4686, Seq. ID No. 4720, Seq. ID No. 4730, Seq. ID No. 4744, Seq. ID No. 4756, Seq. ID No. 4782, Seq. ID No. 4788, Seq. ID No. 4838, Seq. ID No. 4842, Seq. ID No. 4850, Seq. ID No. 4856, Seq. ID No. 4890, Seq. ID No. 4902, Seq. ID No. 4916, Seq. ID No. 4918, Seq. ID No. 4932, Seq. ID No. 4936, Seq. ID No. 4978, Seq. ID No. 5026, Seq. ID No. 5030, Seq. ID No. 5110, Seq. ID No. 5116, Seq. ID No. 5118, Seq. ID No. 5156, Seq. ID No. 5186, Seq. ID No. 5202, Seq. ID No. 5204, Seq. ID No. 5220, Seq. ID No. 5262, Seq. ID No. 5290, Seq. ID No. 5296, Seq. ID No. 5378, Seq. ID No. 5390, Seq. ID No. 5400, Seq. ID No. 5412, Seq. ID No. 5538, Seq. ID No. 5622, Seq. ID No. 5628, Seq. ID No. 5658, Seq. ID No. 5676, Seq. ID No. 5718, Seq. ID No. 5778, Seq. ID No. 5860, Seq. ID No. 5902, Seq. ID No. 5914, Seq. ID No. 5920, Seq. ID No. 5926, Seq. ID No. 5934, Seq. ID No. 6056, Seq. ID No. 6130, Seq. ID No. 6134, Seq. ID No. 6188, Seq. ID No. 6194, Seq. ID No. 6220, Seq. ID No. 6272, Seq. ID No. 6278, Seq. ID No. 6370, Seq. ID No. 6376, Seq. ID No. 6380, Seq. ID No. 6390, Seq. ID No. 6592, and Seq. ID No. 6606.

In yet another preferred embodiment, the polypeptide is selected from the *Alloiococcus otitidis* polypeptides identified as having an LPXTG motif, which are covalently attached to the peptidoglycan layer, and is selected from one of Seq. ID No. 504, Seq. ID No. 506, Seq. ID No. 1316, Seq. ID No. 1318, Seq. ID No. 1364, Seq. ID No. 1366, Seq. ID No. 1368, Seq. ID No. 1370, Seq. ID No. 1560, Seq. ID No. 1562, Seq. ID No. 1582, Seq. ID No. 1740, Seq. ID No. 1742, Seq. ID No. 2812, Seq. ID No.

2814, Seq. ID No. 3620, Seq. ID No. 5588, Seq. ID No. 5590, Seq. ID No. 5592, Seq. ID No. 5782, Seq. ID No. 5784, and Seq. ID No. 6104.

In yet another preferred embodiment, the polypeptide is selected from the *Alloiococcus otitidis* polypeptides identified as lipoproteins using the HMM Lipo  
5 algorithm, and is selected from one Seq. ID No. 46, Seq. ID No. 48, Seq. ID No. 172, Seq. ID No. 226, Seq. ID No. 420, Seq. ID No. 514, Seq. ID No. 576, Seq. ID No. 592, Seq. ID No. 594, Seq. ID No. 658, Seq. ID No. 660, Seq. ID No. 670, Seq. ID No. 676, Seq. ID No. 746, Seq. ID No. 748, Seq. ID No. 936, Seq. ID No. 1046, Seq. ID No. 1076, Seq. ID No. 1138, Seq. ID No. 1174, Seq. ID No. 1192, Seq. ID No. 1194, Seq. ID No.  
10 1196, Seq. ID No. 1564, Seq. ID No. 1662, Seq. ID No. 1664, Seq. ID No. 1666, Seq. ID No. 1792, Seq. ID No. 1798, Seq. ID No. 1918, Seq. ID No. 1970, Seq. ID No. 2116, Seq. ID No. 2160, Seq. ID No. 2430, Seq. ID No. 2528, Seq. ID No. 2700, Seq. ID No. 2816, Seq. ID No. 2876, Seq. ID No. 2976, Seq. ID No. 2978, Seq. ID No. 2992, Seq. ID No. 3044, Seq. ID No. 3324, Seq. ID No. 3338, Seq. ID No. 4134, Seq. ID No. 4138, Seq. ID No. 4482, Seq. ID No. 4706, Seq. ID No. 4828, Seq. ID No. 4870, Seq. ID No.  
15 5116, Seq. ID No. 5378, Seq. ID No. 5380, Seq. ID No. 5492, Seq. ID No. 5510, Seq. ID No. 5514, Seq. ID No. 5526, Seq. ID No. 5530, Seq. ID No. 5532, Seq. ID No. 5890, Seq. ID No. 5910, Seq. ID No. 6026, Seq. ID No. 6028, Seq. ID No. 6088, Seq. ID No. 6090, Seq. ID No. 6326, Seq. ID No. 6328, Seq. ID No. 6416, Seq. ID No. 6638, Seq. ID  
20 No. 6640, and Seq. ID No. 6646.

In yet another preferred embodiment, the polypeptide is selected from the *Alloiococcus otitidis* polypeptides, wherein the polypeptide is non-covalently associated with the peptidoglycan layer and is selected from one of Seq. ID No. 3590, Seq. ID No. 3988, Seq. ID No. 5220, and Seq. ID No. 5338.

In yet another preferred embodiment, the polypeptide is selected from the *Alloiococcus otitidis* polypeptides having an RGD<sub>X</sub> motif wherein X is not a proline residue, and is selected from one of Seq. ID No. 38, Seq. ID No. 100, Seq. ID No. 108, Seq. ID No. 110, Seq. ID No. 112, Seq. ID No. 352, Seq. ID No. 354, Seq. ID No. 466, Seq. ID No. 468, Seq. ID No. 470, Seq. ID No. 472, Seq. ID No. 684, Seq. ID No. 822,  
25 Seq. ID No. 824, Seq. ID No. 1022, Seq. ID No. 1024, Seq. ID No. 1158, Seq. ID No. 1160, Seq. ID No. 1234, Seq. ID No. 1334, Seq. ID No. 1336, Seq. ID No. 1450, Seq. ID No. 1560, Seq. ID No. 1562, Seq. ID No. 1564, Seq. ID No. 1626, Seq. ID No. 1778, Seq. ID No. 1828, Seq. ID No. 1830, Seq. ID No. 1872, Seq. ID No. 1926, Seq. ID No.  
30



2136, Seq. ID No. 2146, Seq. ID No. 2174, Seq. ID No. 2176, Seq. ID No. 2178, Seq. ID No. 2180, Seq. ID No. 2260, Seq. ID No. 2318, Seq. ID No. 2320, Seq. ID No. 2322, Seq. ID No. 2324, Seq. ID No. 2326, Seq. ID No. 2328, Seq. ID No. 2330, Seq. ID No. 2402, Seq. ID No. 2672, Seq. ID No. 2864, Seq. ID No. 2870, Seq. ID No. 2920, Seq. ID No. 2922, Seq. ID No. 2994, Seq. ID No. 3088, Seq. ID No. 3138, Seq. ID No. 3280, Seq. ID No. 3282, Seq. ID No. 3284, Seq. ID No. 3334, Seq. ID No. 3336, Seq. ID No. 3498, Seq. ID No. 3500, Seq. ID No. 3502, Seq. ID No. 3534, Seq. ID No. 3672, Seq. ID No. 3674, Seq. ID No. 3676, Seq. ID No. 3838, Seq. ID No. 3840, Seq. ID No. 3842, Seq. ID No. 3844, Seq. ID No. 3930, Seq. ID No. 3962, Seq. ID No. 4038, Seq. ID No. 4194, Seq. ID No. 4240, Seq. ID No. 4328, Seq. ID No. 4330, Seq. ID No. 4334, Seq. ID No. 4394, Seq. ID No. 4464, Seq. ID No. 4466, Seq. ID No. 4468, Seq. ID No. 4598, Seq. ID No. 4630, Seq. ID No. 4632, Seq. ID No. 4676, Seq. ID No. 4678, Seq. ID No. 4680, Seq. ID No. 4690, Seq. ID No. 4692, Seq. ID No. 4694, Seq. ID No. 4782, Seq. ID No. 4800, Seq. ID No. 4802, Seq. ID No. 4804, Seq. ID No. 4862, Seq. ID No. 5010, Seq. ID No. 5144, Seq. ID No. 5146, Seq. ID No. 5180, Seq. ID No. 5182, Seq. ID No. 5184, Seq. ID No. 5250, Seq. ID No. 5252, Seq. ID No. 5254, Seq. ID No. 5260, Seq. ID No. 5262, Seq. ID No. 5294, Seq. ID No. 5296, Seq. ID No. 5298, Seq. ID No. 5300, Seq. ID No. 5308, Seq. ID No. 5310, Seq. ID No. 5412, Seq. ID No. 5536, Seq. ID No. 5538, Seq. ID No. 5746, Seq. ID No. 5822, Seq. ID No. 5824, Seq. ID No. 5826, Seq. ID No. 6030, Seq. ID No. 6172, Seq. ID No. 6308, Seq. ID No. 6310, and Seq. ID No. 6312.

In another preferred embodiment, the polypeptide is selected from *Alloiococcus otitidis* polypeptides predicted by BlastP as being involved in capsule biosynthesis and transport, and is selected from one of Seq. ID No. 50, Seq. ID No. 52, Seq. ID No. 54, Seq. ID No. 60, Seq. ID No. 196, Seq. ID No. 690, Seq. ID No. 704, Seq. ID No. 926, Seq. ID No. 1598, Seq. ID No. 1602, Seq. ID No. 1608, Seq. ID No. 1612, Seq. ID No. 1614, Seq. ID No. 1714, Seq. ID No. 2030, Seq. ID No. 2264, Seq. ID No. 2270, Seq. ID No. 2374, Seq. ID No. 2438, Seq. ID No. 2652, Seq. ID No. 2768, Seq. ID No. 2908, Seq. ID No. 3398, Seq. ID No. 3400, Seq. ID No. 3480, Seq. ID No. 3488, Seq. ID No. 3492, Seq. ID No. 3494, Seq. ID No. 3496, Seq. ID No. 3498, Seq. ID No. 3520, Seq. ID No. 3522, Seq. ID No. 3530, Seq. ID No. 3536, Seq. ID No. 3562, Seq. ID No. 3884, Seq. ID No. 3892, Seq. ID No. 3982, and Seq. ID No. 4088.

In another preferred embodiment, the polypeptide is selected from *Alloiococcus otitidis* polypeptides predicted by BlastP as being localized in the capsule loci region of

*Alloiococcus otitidis*, and is selected from one of Seq. ID No. 46, Seq. ID No. 48, Seq. ID No. 52, Seq. ID No. 54, Seq. ID No. 56, Seq. ID No. 58, Seq. ID No. 60, Seq. ID No. 684, Seq. ID No. 686, Seq. ID No. 688, Seq. ID No. 690, Seq. ID No. 692, Seq. ID No. 694, Seq. ID No. 696, Seq. ID No. 698, Seq. ID No. 700, Seq. ID No. 702, Seq. ID No. 704, 5 Seq. ID No. 706, Seq. ID No. 708, Seq. ID No. 710, Seq. ID No. 712, Seq. ID No. 714, Seq. ID No. 716, Seq. ID No. 718, Seq. ID No. 720, Seq. ID No. 722, Seq. ID No. 724, Seq. ID No. 726, Seq. ID No. 728, Seq. ID No. 730, Seq. ID No. 732, Seq. ID No. 734, Seq. ID No. 736, Seq. ID No. 738, Seq. ID No. 740, Seq. ID No. 742, Seq. ID No. 744, Seq. ID No. 746, Seq. ID No. 748, Seq. ID No. 750, Seq. ID No. 752, Seq. ID No. 754, 10 Seq. ID No. 3390, Seq. ID No. 3392, Seq. ID No. 3394, Seq. ID No. 3396, Seq. ID No. 3398, Seq. ID No. 3400, Seq. ID No. 3402, Seq. ID No. 3404, Seq. ID No. 3406, Seq. ID No. 3408, Seq. ID No. 3410, Seq. ID No. 3412, Seq. ID No. 3414, Seq. ID No. 3416, Seq. ID No. 3418, Seq. ID No. 3420, Seq. ID No. 3422, Seq. ID No. 3424, Seq. ID No. 3426, Seq. ID No. 3428, Seq. ID No. 3430, Seq. ID No. 3432, Seq. ID No. 3434, Seq. ID 15 No. 3436, Seq. ID No. 3438, Seq. ID No. 3440, Seq. ID No. 3442, Seq. ID No. 3444, Seq. ID No. 3446, Seq. ID No. 3448, Seq. ID No. 3450, Seq. ID No. 3452, Seq. ID No. 3454, Seq. ID No. 3456, Seq. ID No. 3458, Seq. ID No. 3460, Seq. ID No. 3462, Seq. ID No. 3464, Seq. ID No. 3466, Seq. ID No. 3468, Seq. ID No. 3470, Seq. ID No. 3472, Seq. ID No. 3474, Seq. ID No. 3476, Seq. ID No. 3478, Seq. ID No. 3480, Seq. ID No. 20 3482, Seq. ID No. 3484, Seq. ID No. 3486, Seq. ID No. 3488, Seq. ID No. 3490, Seq. ID No. 3492, Seq. ID No. 3494, Seq. ID No. 3496, Seq. ID No. 3498, Seq. ID No. 3500, Seq. ID No. 3502, Seq. ID No. 3504, Seq. ID No. 3506, Seq. ID No. 3508, Seq. ID No. 3510, Seq. ID No. 3512, Seq. ID No. 3514, Seq. ID No. 3516, Seq. ID No. 3518, Seq. ID No. 3520, Seq. ID No. 3522, Seq. ID No. 3524, Seq. ID No. 3526, Seq. ID No. 3528, 25 Seq. ID No. 3530, Seq. ID No. 3532, Seq. ID No. 3534, Seq. ID No. 3536, Seq. ID No. 3538, Seq. ID No. 3540, Seq. ID No. 3542, Seq. ID No. 3544, Seq. ID No. 3546, Seq. ID No. 3548, Seq. ID No. 3550, Seq. ID No. 3552, Seq. ID No. 3554, Seq. ID No. 3556, Seq. ID No. 3558, Seq. ID No. 3560, and Seq. ID No. 3562.

In another preferred embodiment, the polypeptide is selected from the 30 *Alloiococcus otitidis* polypeptides identified by BlastP analysis to be associated with sporulation, and is selected from one of Seq. ID No. 1138, Seq. ID No. 1456, Seq. ID No. 2138, Seq. ID No. 2142, Seq. ID No. 2166, Seq. ID No. 2180, Seq. ID No. 2302, Seq. ID

No. 2754, Seq. ID No. 4212, Seq. ID No. 4252, Seq. ID No. 4328, Seq. ID No. 4570, Seq. ID No. 4720, and Seq. ID No. 4730.

In another preferred embodiment, the polypeptide is selected from the *Alloiococcus otitidis* polypeptides identified by BlastP analysis as being encoded by unique ORFs, and is selected from one of Seq. ID No. 8, Seq. ID No. 20, Seq. ID No. 22, Seq. ID No. 24, Seq. ID No. 32, Seq. ID No. 40, Seq. ID No. 66, Seq. ID No. 68, Seq. ID No. 70, Seq. ID No. 92, Seq. ID No. 100, Seq. ID No. 106, Seq. ID No. 114, Seq. ID No. 116, Seq. ID No. 124, Seq. ID No. 126, Seq. ID No. 128, Seq. ID No. 132, Seq. ID No. 134, Seq. ID No. 140, Seq. ID No. 152, Seq. ID No. 160, Seq. ID No. 162, Seq. ID No. 164, Seq. ID No. 166, Seq. ID No. 170, Seq. ID No. 186, Seq. ID No. 190, Seq. ID No. 194, Seq. ID No. 230, Seq. ID No. 232, Seq. ID No. 256, Seq. ID No. 258, Seq. ID No. 260, Seq. ID No. 276, Seq. ID No. 338, Seq. ID No. 340, Seq. ID No. 348, Seq. ID No. 350, Seq. ID No. 358, Seq. ID No. 360, Seq. ID No. 370, Seq. ID No. 372, Seq. ID No. 378, Seq. ID No. 386, Seq. ID No. 388, Seq. ID No. 394, Seq. ID No. 400, Seq. ID No. 402, Seq. ID No. 404, Seq. ID No. 408, Seq. ID No. 420, Seq. ID No. 432, Seq. ID No. 478, Seq. ID No. 496, Seq. ID No. 508, Seq. ID No. 520, Seq. ID No. 542, Seq. ID No. 546, Seq. ID No. 548, Seq. ID No. 550, Seq. ID No. 558, Seq. ID No. 590, Seq. ID No. 618, Seq. ID No. 620, Seq. ID No. 634, Seq. ID No. 640, Seq. ID No. 642, Seq. ID No. 644, Seq. ID No. 646, Seq. ID No. 648, Seq. ID No. 652, Seq. ID No. 654, Seq. ID No. 656, Seq. ID No. 668, Seq. ID No. 692, Seq. ID No. 694, Seq. ID No. 696, Seq. ID No. 698, Seq. ID No. 716, Seq. ID No. 718, Seq. ID No. 720, Seq. ID No. 732, Seq. ID No. 734, Seq. ID No. 742, Seq. ID No. 744, Seq. ID No. 746, Seq. ID No. 748, Seq. ID No. 750, Seq. ID No. 752, Seq. ID No. 756, Seq. ID No. 758, Seq. ID No. 760, Seq. ID No. 762, Seq. ID No. 764, Seq. ID No. 766, Seq. ID No. 768, Seq. ID No. 802, Seq. ID No. 804, Seq. ID No. 806, Seq. ID No. 808, Seq. ID No. 810, Seq. ID No. 812, Seq. ID No. 814, Seq. ID No. 834, Seq. ID No. 842, Seq. ID No. 850, Seq. ID No. 852, Seq. ID No. 854, Seq. ID No. 856, Seq. ID No. 888, Seq. ID No. 890, Seq. ID No. 892, Seq. ID No. 904, Seq. ID No. 906, Seq. ID No. 910, Seq. ID No. 938, Seq. ID No. 942, Seq. ID No. 944, Seq. ID No. 952, Seq. ID No. 958, Seq. ID No. 974, Seq. ID No. 976, Seq. ID No. 988, Seq. ID No. 1006, Seq. ID No. 1008, Seq. ID No. 1010, Seq. ID No. 1012, Seq. ID No. 1020, Seq. ID No. 1026, Seq. ID No. 1028, Seq. ID No. 1046, Seq. ID No. 1048, Seq. ID No. 1072, Seq. ID No. 1074, Seq. ID No. 1078, Seq. ID No. 1106, Seq. ID No. 1108, Seq. ID No. 1112, Seq. ID No. 1132, Seq. ID No. 1136, Seq. ID No. 1140, Seq. ID

No. 1152, Seq. ID No. 1154, Seq. ID No. 1166, Seq. ID No. 1168, Seq. ID No. 1170,  
Seq. ID No. 1172, Seq. ID No. 1174, Seq. ID No. 1182, Seq. ID No. 1184, Seq. ID No.  
1186, Seq. ID No. 1188, Seq. ID No. 1190, Seq. ID No. 1192, Seq. ID No. 1194, Seq. ID  
No. 1196, Seq. ID No. 1198, Seq. ID No. 1200, Seq. ID No. 1202, Seq. ID No. 1204,  
5 Seq. ID No. 1208, Seq. ID No. 1214, Seq. ID No. 1228, Seq. ID No. 1230, Seq. ID No.  
1240, Seq. ID No. 1244, Seq. ID No. 1246, Seq. ID No. 1248, Seq. ID No. 1250, Seq. ID  
No. 1260, Seq. ID No. 1266, Seq. ID No. 1268, Seq. ID No. 1270, Seq. ID No. 1272,  
Seq. ID No. 1274, Seq. ID No. 1276, Seq. ID No. 1278, Seq. ID No. 1280, Seq. ID No.  
1282, Seq. ID No. 1284, Seq. ID No. 1286, Seq. ID No. 1288, Seq. ID No. 1290, Seq. ID  
10 No. 1292, Seq. ID No. 1294, Seq. ID No. 1296, Seq. ID No. 1298, Seq. ID No. 1300,  
Seq. ID No. 1302, Seq. ID No. 1304, Seq. ID No. 1306, Seq. ID No. 1308, Seq. ID No.  
1310, Seq. ID No. 1312, Seq. ID No. 1314, Seq. ID No. 1320, Seq. ID No. 1322, Seq. ID  
No. 1324, Seq. ID No. 1326, Seq. ID No. 1328, Seq. ID No. 1338, Seq. ID No. 1342,  
Seq. ID No. 1344, Seq. ID No. 1348, Seq. ID No. 1350, Seq. ID No. 1352, Seq. ID No.  
15 1354, Seq. ID No. 1356, Seq. ID No. 1372, Seq. ID No. 1380, Seq. ID No. 1382, Seq. ID  
No. 1390, Seq. ID No. 1398, Seq. ID No. 1400, Seq. ID No. 1402, Seq. ID No. 1418,  
Seq. ID No. 1420, Seq. ID No. 1422, Seq. ID No. 1424, Seq. ID No. 1440, Seq. ID No.  
1446, Seq. ID No. 1448, Seq. ID No. 1458, Seq. ID No. 1466, Seq. ID No. 1480, Seq. ID  
No. 1512, Seq. ID No. 1552, Seq. ID No. 1554, Seq. ID No. 1556, Seq. ID No. 1558,  
20 Seq. ID No. 1580, Seq. ID No. 1610, Seq. ID No. 1622, Seq. ID No. 1624, Seq. ID No.  
1626, Seq. ID No. 1628, Seq. ID No. 1630, Seq. ID No. 1632, Seq. ID No. 1634, Seq. ID  
No. 1640, Seq. ID No. 1644, Seq. ID No. 1656, Seq. ID No. 1668, Seq. ID No. 1672,  
Seq. ID No. 1694, Seq. ID No. 1696, Seq. ID No. 1702, Seq. ID No. 1704, Seq. ID No.  
1706, Seq. ID No. 1722, Seq. ID No. 1724, Seq. ID No. 1732, Seq. ID No. 1738, Seq. ID  
25 No. 1744, Seq. ID No. 1760, Seq. ID No. 1764, Seq. ID No. 1774, Seq. ID No. 1776,  
Seq. ID No. 1778, Seq. ID No. 1780, Seq. ID No. 1782, Seq. ID No. 1800, Seq. ID No.  
1802, Seq. ID No. 1804, Seq. ID No. 1808, Seq. ID No. 1824, Seq. ID No. 1832, Seq. ID  
No. 1852, Seq. ID No. 1858, Seq. ID No. 1876, Seq. ID No. 1900, Seq. ID No. 1916,  
Seq. ID No. 1928, Seq. ID No. 1930, Seq. ID No. 1974, Seq. ID No. 1978, Seq. ID No.  
30 1982, Seq. ID No. 2006, Seq. ID No. 2008, Seq. ID No. 2010, Seq. ID No. 2012, Seq. ID  
No. 2018, Seq. ID No. 2020, Seq. ID No. 2024, Seq. ID No. 2026, Seq. ID No. 2028,  
Seq. ID No. 2040, Seq. ID No. 2042, Seq. ID No. 2044, Seq. ID No. 2046, Seq. ID No.  
2050, Seq. ID No. 2082, Seq. ID No. 2084, Seq. ID No. 2086, Seq. ID No. 2106, Seq. ID

No. 2108, Seq. ID No. 2110, Seq. ID No. 2112, Seq. ID No. 2130, Seq. ID No. 2132, Seq. ID No. 2134, Seq. ID No. 2146, Seq. ID No. 2156, Seq. ID No. 2158, Seq. ID No. 2160, Seq. ID No. 2162, Seq. ID No. 2172, Seq. ID No. 2188, Seq. ID No. 2190, Seq. ID No. 2202, Seq. ID No. 2204, Seq. ID No. 2210, Seq. ID No. 2212, Seq. ID No. 2220, Seq. ID No. 2226, Seq. ID No. 2244, Seq. ID No. 2246, Seq. ID No. 2248, Seq. ID No. 2250, Seq. ID No. 2252, Seq. ID No. 2256, Seq. ID No. 2278, Seq. ID No. 2280, Seq. ID No. 2342, Seq. ID No. 2352, Seq. ID No. 2354, Seq. ID No. 2356, Seq. ID No. 2358, Seq. ID No. 2360, Seq. ID No. 2366, Seq. ID No. 2368, Seq. ID No. 2372, Seq. ID No. 2376, Seq. ID No. 2394, Seq. ID No. 2396, Seq. ID No. 2426, Seq. ID No. 2428, Seq. ID No. 2432, Seq. ID No. 2440, Seq. ID No. 2442, Seq. ID No. 2444, Seq. ID No. 2448, Seq. ID No. 2460, Seq. ID No. 2480, Seq. ID No. 2494, Seq. ID No. 2502, Seq. ID No. 2504, Seq. ID No. 2522, Seq. ID No. 2524, Seq. ID No. 2528, Seq. ID No. 2592, Seq. ID No. 2602, Seq. ID No. 2604, Seq. ID No. 2612, Seq. ID No. 2628, Seq. ID No. 2630, Seq. ID No. 2654, Seq. ID No. 2662, Seq. ID No. 2692, Seq. ID No. 2696, Seq. ID No. 2698, Seq. ID No. 2718, Seq. ID No. 2730, Seq. ID No. 2732, Seq. ID No. 2734, Seq. ID No. 2736, Seq. ID No. 2740, Seq. ID No. 2742, Seq. ID No. 2744, Seq. ID No. 2778, Seq. ID No. 2780, Seq. ID No. 2782, Seq. ID No. 2784, Seq. ID No. 2802, Seq. ID No. 2806, Seq. ID No. 2808, Seq. ID No. 2810, Seq. ID No. 2812, Seq. ID No. 2814, Seq. ID No. 2816, Seq. ID No. 2818, Seq. ID No. 2820, Seq. ID No. 2830, Seq. ID No. 2832, Seq. ID No. 2834, Seq. ID No. 2836, Seq. ID No. 2838, Seq. ID No. 2840, Seq. ID No. 2842, Seq. ID No. 2846, Seq. ID No. 2850, Seq. ID No. 2852, Seq. ID No. 2854, Seq. ID No. 2856, Seq. ID No. 2858, Seq. ID No. 2860, Seq. ID No. 2862, Seq. ID No. 2866, Seq. ID No. 2874, Seq. ID No. 2876, Seq. ID No. 2878, Seq. ID No. 2884, Seq. ID No. 2886, Seq. ID No. 2888, Seq. ID No. 2890, Seq. ID No. 2894, Seq. ID No. 2896, Seq. ID No. 2904, Seq. ID No. 2910, Seq. ID No. 2936, Seq. ID No. 2938, Seq. ID No. 2940, Seq. ID No. 2942, Seq. ID No. 2944, Seq. ID No. 2946, Seq. ID No. 2948, Seq. ID No. 2950, Seq. ID No. 2952, Seq. ID No. 2954, Seq. ID No. 2966, Seq. ID No. 2968, Seq. ID No. 2974, Seq. ID No. 2976, Seq. ID No. 2978, Seq. ID No. 2982, Seq. ID No. 2984, Seq. ID No. 2986, Seq. ID No. 2988, Seq. ID No. 2990, Seq. ID No. 2992, Seq. ID No. 3002, Seq. ID No. 3008, Seq. ID No. 3010, Seq. ID No. 3012, Seq. ID No. 3022, Seq. ID No. 3024, Seq. ID No. 3042, Seq. ID No. 3046, Seq. ID No. 3072, Seq. ID No. 3088, Seq. ID No. 3106, Seq. ID No. 3108, Seq. ID No. 3120, Seq. ID No. 3122, Seq. ID No. 3124, Seq. ID No. 3152, Seq. ID No. 3154, Seq. ID No. 3168, Seq. ID No. 3174, Seq. ID

No. 3176, Seq. ID No. 3178, Seq. ID No. 3182, Seq. ID No. 3194, Seq. ID No. 3214, Seq. ID No. 3216, Seq. ID No. 3218, Seq. ID No. 3220, Seq. ID No. 3222, Seq. ID No. 3224, Seq. ID No. 3232, Seq. ID No. 3234, Seq. ID No. 3236, Seq. ID No. 3238, Seq. ID No. 3240, Seq. ID No. 3242, Seq. ID No. 3244, Seq. ID No. 3246, Seq. ID No. 3248, Seq. ID No. 3250, Seq. ID No. 3262, Seq. ID No. 3264, Seq. ID No. 3266, Seq. ID No. 3268, Seq. ID No. 3270, Seq. ID No. 3272, Seq. ID No. 3274, Seq. ID No. 3276, Seq. ID No. 3278, Seq. ID No. 3326, Seq. ID No. 3332, Seq. ID No. 3340, Seq. ID No. 3342, Seq. ID No. 3350, Seq. ID No. 3362, Seq. ID No. 3364, Seq. ID No. 3370, Seq. ID No. 3372, Seq. ID No. 3390, Seq. ID No. 3404, Seq. ID No. 3418, Seq. ID No. 3420, Seq. ID No. 3422, Seq. ID No. 3434, Seq. ID No. 3438, Seq. ID No. 3442, Seq. ID No. 3444, Seq. ID No. 3446, Seq. ID No. 3448, Seq. ID No. 3474, Seq. ID No. 3482, Seq. ID No. 3484, Seq. ID No. 3490, Seq. ID No. 3504, Seq. ID No. 3506, Seq. ID No. 3510, Seq. ID No. 3512, Seq. ID No. 3524, Seq. ID No. 3526, Seq. ID No. 3532, Seq. ID No. 3534, Seq. ID No. 3540, Seq. ID No. 3542, Seq. ID No. 3544, Seq. ID No. 3546, Seq. ID No. 3548, Seq. ID No. 3556, Seq. ID No. 3558, Seq. ID No. 3564, Seq. ID No. 3566, Seq. ID No. 3572, Seq. ID No. 3574, Seq. ID No. 3582, Seq. ID No. 3588, Seq. ID No. 3592, Seq. ID No. 3594, Seq. ID No. 3596, Seq. ID No. 3612, Seq. ID No. 3614, Seq. ID No. 3618, Seq. ID No. 3620, Seq. ID No. 3622, Seq. ID No. 3624, Seq. ID No. 3626, Seq. ID No. 3632, Seq. ID No. 3638, Seq. ID No. 3640, Seq. ID No. 3656, Seq. ID No. 3658, Seq. ID No. 3660, Seq. ID No. 3662, Seq. ID No. 3678, Seq. ID No. 3680, Seq. ID No. 3684, Seq. ID No. 3686, Seq. ID No. 3702, Seq. ID No. 3704, Seq. ID No. 3718, Seq. ID No. 3720, Seq. ID No. 3722, Seq. ID No. 3724, Seq. ID No. 3730, Seq. ID No. 3732, Seq. ID No. 3734, Seq. ID No. 3736, Seq. ID No. 3738, Seq. ID No. 3740, Seq. ID No. 3742, Seq. ID No. 3750, Seq. ID No. 3752, Seq. ID No. 3754, Seq. ID No. 3756, Seq. ID No. 3762, Seq. ID No. 3782, Seq. ID No. 3784, Seq. ID No. 3786, Seq. ID No. 3788, Seq. ID No. 3790, Seq. ID No. 3792, Seq. ID No. 3800, Seq. ID No. 3808, Seq. ID No. 3810, Seq. ID No. 3812, Seq. ID No. 3814, Seq. ID No. 3816, Seq. ID No. 3818, Seq. ID No. 3828, Seq. ID No. 3830, Seq. ID No. 3832, Seq. ID No. 3834, Seq. ID No. 3836, Seq. ID No. 3850, Seq. ID No. 3880, Seq. ID No. 3882, Seq. ID No. 3896, Seq. ID No. 3904, Seq. ID No. 3910, Seq. ID No. 3916, Seq. ID No. 3940, Seq. ID No. 3960, Seq. ID No. 3962, Seq. ID No. 3964, Seq. ID No. 3966, Seq. ID No. 3974, Seq. ID No. 3978, Seq. ID No. 3980, Seq. ID No. 3994, Seq. ID No. 3996, Seq. ID No. 3998, Seq. ID No. 4006, Seq. ID No. 4008, Seq. ID No. 4010, Seq. ID No. 4042, Seq. ID No. 4044, Seq. ID

No. 4046, Seq. ID No. 4070, Seq. ID No. 4078, Seq. ID No. 4098, Seq. ID No. 4114,  
Seq. ID No. 4124, Seq. ID No. 4132, Seq. ID No. 4134, Seq. ID No. 4136, Seq. ID No.  
4140, Seq. ID No. 4152, Seq. ID No. 4154, Seq. ID No. 4156, Seq. ID No. 4182, Seq. ID  
5 Seq. ID No. 4222, Seq. ID No. 4242, Seq. ID No. 4254, Seq. ID No. 4258, Seq. ID No. 4260,  
Seq. ID No. 4262, Seq. ID No. 4264, Seq. ID No. 4266, Seq. ID No. 4270, Seq. ID No.  
4276, Seq. ID No. 4278, Seq. ID No. 4280, Seq. ID No. 4282, Seq. ID No. 4286, Seq. ID  
No. 4288, Seq. ID No. 4298, Seq. ID No. 4306, Seq. ID No. 4308, Seq. ID No. 4364,  
Seq. ID No. 4366, Seq. ID No. 4372, Seq. ID No. 4374, Seq. ID No. 4396, Seq. ID No.  
4400, Seq. ID No. 4404, Seq. ID No. 4426, Seq. ID No. 4438, Seq. ID No. 4440, Seq. ID  
10 No. 4442, Seq. ID No. 4454, Seq. ID No. 4456, Seq. ID No. 4514, Seq. ID No. 4516,  
Seq. ID No. 4552, Seq. ID No. 4562, Seq. ID No. 4574, Seq. ID No. 4576, Seq. ID No.  
4588, Seq. ID No. 4590, Seq. ID No. 4592, Seq. ID No. 4594, Seq. ID No. 4596, Seq. ID  
No. 4618, Seq. ID No. 4620, Seq. ID No. 4622, Seq. ID No. 4626, Seq. ID No. 4628,  
Seq. ID No. 4634, Seq. ID No. 4636, Seq. ID No. 4638, Seq. ID No. 4640, Seq. ID No.  
15 4660, Seq. ID No. 4682, Seq. ID No. 4688, Seq. ID No. 4696, Seq. ID No. 4700, Seq. ID  
No. 4702, Seq. ID No. 4722, Seq. ID No. 4736, Seq. ID No. 4738, Seq. ID No. 4742,  
Seq. ID No. 4784, Seq. ID No. 4790, Seq. ID No. 4806, Seq. ID No. 4812, Seq. ID No.  
4818, Seq. ID No. 4820, Seq. ID No. 4822, Seq. ID No. 4824, Seq. ID No. 4836, Seq. ID  
No. 4854, Seq. ID No. 4886, Seq. ID No. 4914, Seq. ID No. 4924, Seq. ID No. 4950,  
20 Seq. ID No. 4952, Seq. ID No. 4976, Seq. ID No. 4982, Seq. ID No. 4984, Seq. ID No.  
4988, Seq. ID No. 4994, Seq. ID No. 5000, Seq. ID No. 5002, Seq. ID No. 5012, Seq. ID  
No. 5014, Seq. ID No. 5024, Seq. ID No. 5032, Seq. ID No. 5034, Seq. ID No. 5036,  
Seq. ID No. 5038, Seq. ID No. 5042, Seq. ID No. 5044, Seq. ID No. 5054, Seq. ID No.  
5062, Seq. ID No. 5064, Seq. ID No. 5086, Seq. ID No. 5094, Seq. ID No. 5152, Seq. ID  
25 No. 5154, Seq. ID No. 5160, Seq. ID No. 5162, Seq. ID No. 5168, Seq. ID No. 5174,  
Seq. ID No. 5176, Seq. ID No. 5178, Seq. ID No. 5190, Seq. ID No. 5192, Seq. ID No.  
5194, Seq. ID No. 5198, Seq. ID No. 5200, Seq. ID No. 5222, Seq. ID No. 5224, Seq. ID  
No. 5226, Seq. ID No. 5228, Seq. ID No. 5238, Seq. ID No. 5268, Seq. ID No. 5270,  
Seq. ID No. 5272, Seq. ID No. 5282, Seq. ID No. 5302, Seq. ID No. 5304, Seq. ID No.  
30 5316, Seq. ID No. 5322, Seq. ID No. 5328, Seq. ID No. 5348, Seq. ID No. 5386, Seq. ID  
No. 5446, Seq. ID No. 5448, Seq. ID No. 5460, Seq. ID No. 5466, Seq. ID No. 5468,  
Seq. ID No. 5480, Seq. ID No. 5482, Seq. ID No. 5486, Seq. ID No. 5488, Seq. ID No.  
5516, Seq. ID No. 5518, Seq. ID No. 5534, Seq. ID No. 5544, Seq. ID No. 5546, Seq. ID

No. 5550, Seq. ID No. 5570, Seq. ID No. 5578, Seq. ID No. 5594, Seq. ID No. 5596,  
Seq. ID No. 5610, Seq. ID No. 5624, Seq. ID No. 5626, Seq. ID No. 5640, Seq. ID No.  
5642, Seq. ID No. 5644, Seq. ID No. 5650, Seq. ID No. 5660, Seq. ID No. 5662, Seq. ID  
No. 5664, Seq. ID No. 5668, Seq. ID No. 5672, Seq. ID No. 5688, Seq. ID No. 5690,  
5 Seq. ID No. 5704, Seq. ID No. 5706, Seq. ID No. 5710, Seq. ID No. 5712, Seq. ID No.  
5738, Seq. ID No. 5740, Seq. ID No. 5746, Seq. ID No. 5752, Seq. ID No. 5764, Seq. ID  
No. 5798, Seq. ID No. 5812, Seq. ID No. 5814, Seq. ID No. 5816, Seq. ID No. 5828,  
Seq. ID No. 5830, Seq. ID No. 5844, Seq. ID No. 5846, Seq. ID No. 5874, Seq. ID No.  
5880, Seq. ID No. 5884, Seq. ID No. 5886, Seq. ID No. 5888, Seq. ID No. 5890, Seq. ID  
10 No. 5892, Seq. ID No. 5932, Seq. ID No. 5956, Seq. ID No. 5964, Seq. ID No. 5966,  
Seq. ID No. 5976, Seq. ID No. 5984, Seq. ID No. 5986, Seq. ID No. 5988, Seq. ID No.  
5990, Seq. ID No. 6006, Seq. ID No. 6014, Seq. ID No. 6032, Seq. ID No. 6036, Seq. ID  
No. 6046, Seq. ID No. 6060, Seq. ID No. 6062, Seq. ID No. 6064, Seq. ID No. 6074,  
Seq. ID No. 6082, Seq. ID No. 6092, Seq. ID No. 6094, Seq. ID No. 6128, Seq. ID No.  
15 6160, Seq. ID No. 6198, Seq. ID No. 6200, Seq. ID No. 6204, Seq. ID No. 6218, Seq. ID  
No. 6222, Seq. ID No. 6224, Seq. ID No. 6238, Seq. ID No. 6240, Seq. ID No. 6242,  
Seq. ID No. 6246, Seq. ID No. 6248, Seq. ID No. 6250, Seq. ID No. 6260, Seq. ID No.  
6266, Seq. ID No. 6268, Seq. ID No. 6274, Seq. ID No. 6284, Seq. ID No. 6286, Seq. ID  
No. 6324, Seq. ID No. 6326, Seq. ID No. 6328, Seq. ID No. 6362, Seq. ID No. 6364,  
20 Seq. ID No. 6378, Seq. ID No. 6382, Seq. ID No. 6402, Seq. ID No. 6404, Seq. ID No.  
6420, Seq. ID No. 6426, Seq. ID No. 6428, Seq. ID No. 6430, Seq. ID No. 6432, Seq. ID  
No. 6434, Seq. ID No. 6436, Seq. ID No. 6438, Seq. ID No. 6440, Seq. ID No. 6448,  
Seq. ID No. 6450, Seq. ID No. 6452, Seq. ID No. 6454, Seq. ID No. 6456, Seq. ID No.  
6458, Seq. ID No. 6466, Seq. ID No. 6468, Seq. ID No. 6470, Seq. ID No. 6472, Seq. ID  
25 No. 6474, Seq. ID No. 6476, Seq. ID No. 6478, Seq. ID No. 6480, Seq. ID No. 6482,  
Seq. ID No. 6484, Seq. ID No. 6486, Seq. ID No. 6488, Seq. ID No. 6490, Seq. ID No.  
6492, Seq. ID No. 6496, Seq. ID No. 6498, Seq. ID No. 6508, Seq. ID No. 6518, Seq. ID  
No. 6520, Seq. ID No. 6522, Seq. ID No. 6524, Seq. ID No. 6526, Seq. ID No. 6528,  
Seq. ID No. 6530, Seq. ID No. 6534, Seq. ID No. 6540, Seq. ID No. 6542, Seq. ID No.  
30 6544, Seq. ID No. 6556, Seq. ID No. 6558, Seq. ID No. 6562, Seq. ID No. 6564, Seq. ID  
No. 6566, Seq. ID No. 6568, Seq. ID No. 6570, Seq. ID No. 6572, Seq. ID No. 6574,  
Seq. ID No. 6582, Seq. ID No. 6584, Seq. ID No. 6632, Seq. ID No. 6636, Seq. ID No.



6638, Seq. ID No. 6640, Seq. ID No. 6644, Seq. ID No. 6646, Seq. ID No. 6648, and Seq. ID No. 6650.

In yet another preferred embodiment, the polypeptide is selected from the *Alloiococcus otitidis* polypeptides identified by Glimmer™ ORF finder program, and is  
5 selected from one of Seq. ID No. 2, Seq. ID No. 6, Seq. ID No. 12, Seq. ID No. 14, Seq. ID No. 16, Seq. ID No. 18, Seq. ID No. 26, Seq. ID No. 28, Seq. ID No. 30, Seq. ID No. 36, Seq. ID No. 38, Seq. ID No. 42, Seq. ID No. 44, Seq. ID No. 48, Seq. ID No. 52, Seq. ID No. 54, Seq. ID No. 60, Seq. ID No. 64, Seq. ID No. 70, Seq. ID No. 74, Seq. ID No. 76, Seq. ID No. 82, Seq. ID No. 84, Seq. ID No. 90, Seq. ID No. 94, Seq. ID No. 98, Seq.  
10 ID No. 104, Seq. ID No. 112, Seq. ID No. 122, Seq. ID No. 126, Seq. ID No. 130, Seq. ID No. 136, Seq. ID No. 138, Seq. ID No. 146, Seq. ID No. 150, Seq. ID No. 158, Seq. ID No. 168, Seq. ID No. 174, Seq. ID No. 184, Seq. ID No. 188, Seq. ID No. 190, Seq. ID No. 192, Seq. ID No. 196, Seq. ID No. 198, Seq. ID No. 204, Seq. ID No. 208, Seq. ID No. 216, Seq. ID No. 220, Seq. ID No. 224, Seq. ID No. 226, Seq. ID No. 228, Seq. ID  
15 No. 232, Seq. ID No. 234, Seq. ID No. 240, Seq. ID No. 242, Seq. ID No. 248, Seq. ID No. 254, Seq. ID No. 262, Seq. ID No. 266, Seq. ID No. 270, Seq. ID No. 274, Seq. ID No. 276, Seq. ID No. 278, Seq. ID No. 284, Seq. ID No. 292, Seq. ID No. 294, Seq. ID No. 298, Seq. ID No. 302, Seq. ID No. 308, Seq. ID No. 310, Seq. ID No. 314, Seq. ID No. 318, Seq. ID No. 322, Seq. ID No. 326, Seq. ID No. 336, Seq. ID No. 344, Seq. ID  
20 No. 346, Seq. ID No. 354, Seq. ID No. 356, Seq. ID No. 362, Seq. ID No. 364, Seq. ID No. 368, Seq. ID No. 376, Seq. ID No. 380, Seq. ID No. 384, Seq. ID No. 390, Seq. ID No. 392, Seq. ID No. 398, Seq. ID No. 406, Seq. ID No. 412, Seq. ID No. 416, Seq. ID No. 418, Seq. ID No. 424, Seq. ID No. 426, Seq. ID No. 428, Seq. ID No. 430, Seq. ID No. 436, Seq. ID No. 438, Seq. ID No. 440, Seq. ID No. 442, Seq. ID No. 446, Seq. ID  
25 No. 448, Seq. ID No. 454, Seq. ID No. 462, Seq. ID No. 464, Seq. ID No. 472, Seq. ID No. 486, Seq. ID No. 502, Seq. ID No. 506, Seq. ID No. 512, Seq. ID No. 516, Seq. ID No. 518, Seq. ID No. 522, Seq. ID No. 524, Seq. ID No. 532, Seq. ID No. 534, Seq. ID No. 540, Seq. ID No. 542, Seq. ID No. 544, Seq. ID No. 552, Seq. ID No. 556, Seq. ID No. 562, Seq. ID No. 566, Seq. ID No. 570, Seq. ID No. 576, Seq. ID No. 580, Seq. ID  
30 No. 588, Seq. ID No. 594, Seq. ID No. 598, Seq. ID No. 604, Seq. ID No. 606, Seq. ID No. 610, Seq. ID No. 612, Seq. ID No. 614, Seq. ID No. 616, Seq. ID No. 624, Seq. ID No. 628, Seq. ID No. 630, Seq. ID No. 632, Seq. ID No. 636, Seq. ID No. 638, Seq. ID No. 648, Seq. ID No. 650, Seq. ID No. 662, Seq. ID No. 670, Seq. ID No. 674, Seq. ID

No. 676, Seq. ID No. 682, Seq. ID No. 684, Seq. ID No. 690, Seq. ID No. 702, Seq. ID  
No. 704, Seq. ID No. 710, Seq. ID No. 714, Seq. ID No. 730, Seq. ID No. 734, Seq. ID  
No. 736, Seq. ID No. 738, Seq. ID No. 742, Seq. ID No. 748, Seq. ID No. 752, Seq. ID  
No. 754, Seq. ID No. 760, Seq. ID No. 766, Seq. ID No. 768, Seq. ID No. 772, Seq. ID  
5 No. 782, Seq. ID No. 784, Seq. ID No. 788, Seq. ID No. 792, Seq. ID No. 796, Seq. ID  
No. 800, Seq. ID No. 808, Seq. ID No. 818, Seq. ID No. 820, Seq. ID No. 824, Seq. ID  
No. 828, Seq. ID No. 832, Seq. ID No. 836, Seq. ID No. 838, Seq. ID No. 840, Seq. ID  
No. 848, Seq. ID No. 852, Seq. ID No. 856, Seq. ID No. 860, Seq. ID No. 868, Seq. ID  
No. 872, Seq. ID No. 876, Seq. ID No. 882, Seq. ID No. 886, Seq. ID No. 890, Seq. ID  
10 No. 892, Seq. ID No. 896, Seq. ID No. 902, Seq. ID No. 908, Seq. ID No. 916, Seq. ID  
No. 920, Seq. ID No. 926, Seq. ID No. 930, Seq. ID No. 936, Seq. ID No. 940, Seq. ID  
No. 950, Seq. ID No. 952, Seq. ID No. 956, Seq. ID No. 962, Seq. ID No. 966, Seq. ID  
No. 968, Seq. ID No. 972, Seq. ID No. 986, Seq. ID No. 994, Seq. ID No. 998, Seq. ID  
No. 1004, Seq. ID No. 1006, Seq. ID No. 1010, Seq. ID No. 1018, Seq. ID No. 1024,  
15 Seq. ID No. 1040, Seq. ID No. 1042, Seq. ID No. 1044, Seq. ID No. 1052, Seq. ID No.  
1054, Seq. ID No. 1058, Seq. ID No. 1062, Seq. ID No. 1066, Seq. ID No. 1068, Seq. ID  
No. 1070, Seq. ID No. 1074, Seq. ID No. 1076, Seq. ID No. 1084, Seq. ID No. 1088,  
Seq. ID No. 1092, Seq. ID No. 1094, Seq. ID No. 1098, Seq. ID No. 1100, Seq. ID No.  
1104, Seq. ID No. 1110, Seq. ID No. 1116, Seq. ID No. 1118, Seq. ID No. 1124, Seq. ID  
20 No. 1130, Seq. ID No. 1134, Seq. ID No. 1138, Seq. ID No. 1144, Seq. ID No. 1148,  
Seq. ID No. 1150, Seq. ID No. 1156, Seq. ID No. 1158, Seq. ID No. 1160, Seq. ID No.  
1164, Seq. ID No. 1172, Seq. ID No. 1180, Seq. ID No. 1182, Seq. ID No. 1188, Seq. ID  
No. 1194, Seq. ID No. 1200, Seq. ID No. 1206, Seq. ID No. 1212, Seq. ID No. 1218,  
Seq. ID No. 1222, Seq. ID No. 1224, Seq. ID No. 1226, Seq. ID No. 1232, Seq. ID No.  
25 1234, Seq. ID No. 1238, Seq. ID No. 1242, Seq. ID No. 1254, Seq. ID No. 1258, Seq. ID  
No. 1264, Seq. ID No. 1272, Seq. ID No. 1282, Seq. ID No. 1318, Seq. ID No. 1324,  
Seq. ID No. 1332, Seq. ID No. 1336, Seq. ID No. 1340, Seq. ID No. 1346, Seq. ID No.  
1348, Seq. ID No. 1362, Seq. ID No. 1370, Seq. ID No. 1378, Seq. ID No. 1380, Seq. ID  
No. 1388, Seq. ID No. 1394, Seq. ID No. 1396, Seq. ID No. 1400, Seq. ID No. 1404,  
30 Seq. ID No. 1406, Seq. ID No. 1412, Seq. ID No. 1414, Seq. ID No. 1416, Seq. ID No.  
1420, Seq. ID No. 1426, Seq. ID No. 1428, Seq. ID No. 1430, Seq. ID No. 1432, Seq. ID  
No. 1434, Seq. ID No. 1438, Seq. ID No. 1444, Seq. ID No. 1450, Seq. ID No. 1452,  
Seq. ID No. 1456, Seq. ID No. 1458, Seq. ID No. 1460, Seq. ID No. 1464, Seq. ID No.

1466, Seq. ID No. 1470, Seq. ID No. 1472, Seq. ID No. 1474, Seq. ID No. 1476, Seq. ID  
No. 1478, Seq. ID No. 1486, Seq. ID No. 1488, Seq. ID No. 1492, Seq. ID No. 1494,  
Seq. ID No. 1496, Seq. ID No. 1498, Seq. ID No. 1502, Seq. ID No. 1506, Seq. ID No.  
1508, Seq. ID No. 1510, Seq. ID No. 1518, Seq. ID No. 1526, Seq. ID No. 1528, Seq. ID  
5 No. 1532, Seq. ID No. 1540, Seq. ID No. 1542, Seq. ID No. 1544, Seq. ID No. 1550,  
Seq. ID No. 1562, Seq. ID No. 1564, Seq. ID No. 1568, Seq. ID No. 1572, Seq. ID No.  
1574, Seq. ID No. 1578, Seq. ID No. 1582, Seq. ID No. 1590, Seq. ID No. 1594, Seq. ID  
No. 1596, Seq. ID No. 1598, Seq. ID No. 1604, Seq. ID No. 1608, Seq. ID No. 1612,  
Seq. ID No. 1614, Seq. ID No. 1620, Seq. ID No. 1624, Seq. ID No. 1628, Seq. ID No.  
10 1632, Seq. ID No. 1638, Seq. ID No. 1640, Seq. ID No. 1642, Seq. ID No. 1648, Seq. ID  
No. 1654, Seq. ID No. 1658, Seq. ID No. 1666, Seq. ID No. 1670, Seq. ID No. 1682,  
Seq. ID No. 1686, Seq. ID No. 1690, Seq. ID No. 1692, Seq. ID No. 1698, Seq. ID No.  
1700, Seq. ID No. 1708, Seq. ID No. 1712, Seq. ID No. 1714, Seq. ID No. 1720, Seq. ID  
No. 1724, Seq. ID No. 1730, Seq. ID No. 1736, Seq. ID No. 1738, Seq. ID No. 1742,  
15 Seq. ID No. 1748, Seq. ID No. 1752, Seq. ID No. 1758, Seq. ID No. 1760, Seq. ID No.  
1762, Seq. ID No. 1772, Seq. ID No. 1778, Seq. ID No. 1786, Seq. ID No. 1790, Seq. ID  
No. 1792, Seq. ID No. 1798, Seq. ID No. 1802, Seq. ID No. 1804, Seq. ID No. 1806,  
Seq. ID No. 1812, Seq. ID No. 1818, Seq. ID No. 1820, Seq. ID No. 1822, Seq. ID No.  
1826, Seq. ID No. 1830, Seq. ID No. 1838, Seq. ID No. 1844, Seq. ID No. 1846, Seq. ID  
20 No. 1848, Seq. ID No. 1850, Seq. ID No. 1852, Seq. ID No. 1856, Seq. ID No. 1860,  
Seq. ID No. 1864, Seq. ID No. 1866, Seq. ID No. 1868, Seq. ID No. 1872, Seq. ID No.  
1874, Seq. ID No. 1878, Seq. ID No. 1886, Seq. ID No. 1888, Seq. ID No. 1890, Seq. ID  
No. 1896, Seq. ID No. 1898, Seq. ID No. 1900, Seq. ID No. 1904, Seq. ID No. 1906,  
Seq. ID No. 1914, Seq. ID No. 1920, Seq. ID No. 1924, Seq. ID No. 1926, Seq. ID No.  
25 1932, Seq. ID No. 1936, Seq. ID No. 1938, Seq. ID No. 1944, Seq. ID No. 1946, Seq. ID  
No. 1950, Seq. ID No. 1954, Seq. ID No. 1958, Seq. ID No. 1960, Seq. ID No. 1962,  
Seq. ID No. 1966, Seq. ID No. 1968, Seq. ID No. 1972, Seq. ID No. 1976, Seq. ID No.  
1980, Seq. ID No. 1984, Seq. ID No. 1988, Seq. ID No. 1990, Seq. ID No. 1992, Seq. ID  
No. 2000, Seq. ID No. 2002, Seq. ID No. 2004, Seq. ID No. 2010, Seq. ID No. 2016,  
30 Seq. ID No. 2020, Seq. ID No. 2022, Seq. ID No. 2032, Seq. ID No. 2036, Seq. ID No.  
2038, Seq. ID No. 2046, Seq. ID No. 2048, Seq. ID No. 2056, Seq. ID No. 2060, Seq. ID  
No. 2066, Seq. ID No. 2068, Seq. ID No. 2070, Seq. ID No. 2072, Seq. ID No. 2074,  
Seq. ID No. 2080, Seq. ID No. 2092, Seq. ID No. 2094, Seq. ID No. 2098, Seq. ID No.

2100, Seq. ID No. 2104, Seq. ID No. 2116, Seq. ID No. 2120, Seq. ID No. 2128, Seq. ID  
No. 2136, Seq. ID No. 2138, Seq. ID No. 2142, Seq. ID No. 2144, Seq. ID No. 2148,  
Seq. ID No. 2154, Seq. ID No. 2160, Seq. ID No. 2162, Seq. ID No. 2166, Seq. ID No.  
2170, Seq. ID No. 2180, Seq. ID No. 2184, Seq. ID No. 2186, Seq. ID No. 2190, Seq. ID  
5 No. 2192, Seq. ID No. 2194, Seq. ID No. 2196, Seq. ID No. 2200, Seq. ID No. 2208,  
Seq. ID No. 2218, Seq. ID No. 2220, Seq. ID No. 2222, Seq. ID No. 2224, Seq. ID No.  
2228, Seq. ID No. 2230, Seq. ID No. 2232, Seq. ID No. 2234, Seq. ID No. 2242, Seq. ID  
No. 2246, Seq. ID No. 2252, Seq. ID No. 2254, Seq. ID No. 2258, Seq. ID No. 2260,  
Seq. ID No. 2264, Seq. ID No. 2268, Seq. ID No. 2270, Seq. ID No. 2276, Seq. ID No.  
10 2282, Seq. ID No. 2288, Seq. ID No. 2298, Seq. ID No. 2300, Seq. ID No. 2302, Seq. ID  
No. 2316, Seq. ID No. 2330, Seq. ID No. 2334, Seq. ID No. 2336, Seq. ID No. 2340,  
Seq. ID No. 2344, Seq. ID No. 2346, Seq. ID No. 2350, Seq. ID No. 2352, Seq. ID No.  
2358, Seq. ID No. 2360, Seq. ID No. 2364, Seq. ID No. 2366, Seq. ID No. 2370, Seq. ID  
No. 2374, Seq. ID No. 2382, Seq. ID No. 2392, Seq. ID No. 2400, Seq. ID No. 2402,  
15 Seq. ID No. 2406, Seq. ID No. 2410, Seq. ID No. 2416, Seq. ID No. 2418, Seq. ID No.  
2422, Seq. ID No. 2424, Seq. ID No. 2428, Seq. ID No. 2430, Seq. ID No. 2432, Seq. ID  
No. 2436, Seq. ID No. 2438, Seq. ID No. 2440, Seq. ID No. 2444, Seq. ID No. 2446,  
Seq. ID No. 2450, Seq. ID No. 2452, Seq. ID No. 2454, Seq. ID No. 2458, Seq. ID No.  
2464, Seq. ID No. 2466, Seq. ID No. 2470, Seq. ID No. 2472, Seq. ID No. 2476, Seq. ID  
20 No. 2478, Seq. ID No. 2484, Seq. ID No. 2486, Seq. ID No. 2492, Seq. ID No. 2496,  
Seq. ID No. 2506, Seq. ID No. 2508, Seq. ID No. 2514, Seq. ID No. 2520, Seq. ID No.  
2526, Seq. ID No. 2530, Seq. ID No. 2536, Seq. ID No. 2538, Seq. ID No. 2540, Seq. ID  
No. 2550, Seq. ID No. 2554, Seq. ID No. 2564, Seq. ID No. 2568, Seq. ID No. 2576,  
Seq. ID No. 2578, Seq. ID No. 2582, Seq. ID No. 2590, Seq. ID No. 2594, Seq. ID No.  
25 2596, Seq. ID No. 2600, Seq. ID No. 2604, Seq. ID No. 2608, Seq. ID No. 2610, Seq. ID  
No. 2614, Seq. ID No. 2618, Seq. ID No. 2620, Seq. ID No. 2624, Seq. ID No. 2626,  
Seq. ID No. 2632, Seq. ID No. 2634, Seq. ID No. 2640, Seq. ID No. 2642, Seq. ID No.  
2646, Seq. ID No. 2650, Seq. ID No. 2652, Seq. ID No. 2656, Seq. ID No. 2660, Seq. ID  
No. 2664, Seq. ID No. 2668, Seq. ID No. 2670, Seq. ID No. 2672, Seq. ID No. 2678,  
30 Seq. ID No. 2688, Seq. ID No. 2690, Seq. ID No. 2694, Seq. ID No. 2700, Seq. ID No.  
2704, Seq. ID No. 2710, Seq. ID No. 2712, Seq. ID No. 2716, Seq. ID No. 2720, Seq. ID  
No. 2726, Seq. ID No. 2728, Seq. ID No. 2738, Seq. ID No. 2744, Seq. ID No. 2748,  
Seq. ID No. 2752, Seq. ID No. 2754, Seq. ID No. 2760, Seq. ID No. 2764, Seq. ID No.

2766, Seq. ID No. 2768, Seq. ID No. 2772, Seq. ID No. 2774, Seq. ID No. 2776, Seq. ID  
No. 2782, Seq. ID No. 2788, Seq. ID No. 2790, Seq. ID No. 2792, Seq. ID No. 2794,  
Seq. ID No. 2798, Seq. ID No. 2800, Seq. ID No. 2804, Seq. ID No. 2806, Seq. ID No.  
2812, Seq. ID No. 2816, Seq. ID No. 2824, Seq. ID No. 2828, Seq. ID No. 2844, Seq. ID  
5 No. 2848, Seq. ID No. 2864, Seq. ID No. 2868, Seq. ID No. 2870, Seq. ID No. 2872,  
Seq. ID No. 2878, Seq. ID No. 2882, Seq. ID No. 2892, Seq. ID No. 2900, Seq. ID No.  
2902, Seq. ID No. 2904, Seq. ID No. 2908, Seq. ID No. 2912, Seq. ID No. 2914, Seq. ID  
No. 2918, Seq. ID No. 2920, Seq. ID No. 2922, Seq. ID No. 2924, Seq. ID No. 2928,  
Seq. ID No. 2934, Seq. ID No. 2946, Seq. ID No. 2954, Seq. ID No. 2958, Seq. ID No.  
10 2964, Seq. ID No. 2972, Seq. ID No. 2974, Seq. ID No. 2978, Seq. ID No. 2980, Seq. ID  
No. 2984, Seq. ID No. 2986, Seq. ID No. 2992, Seq. ID No. 2994, Seq. ID No. 3000,  
Seq. ID No. 3002, Seq. ID No. 3006, Seq. ID No. 3012, Seq. ID No. 3020, Seq. ID No.  
3028, Seq. ID No. 3034, Seq. ID No. 3036, Seq. ID No. 3040, Seq. ID No. 3044, Seq. ID  
No. 3046, Seq. ID No. 3050, Seq. ID No. 3056, Seq. ID No. 3060, Seq. ID No. 3062,  
15 Seq. ID No. 3068, Seq. ID No. 3070, Seq. ID No. 3082, Seq. ID No. 3090, Seq. ID No.  
3092, Seq. ID No. 3094, Seq. ID No. 3098, Seq. ID No. 3104, Seq. ID No. 3108, Seq. ID  
No. 3112, Seq. ID No. 3118, Seq. ID No. 3126, Seq. ID No. 3134, Seq. ID No. 3136,  
Seq. ID No. 3138, Seq. ID No. 3142, Seq. ID No. 3144, Seq. ID No. 3150, Seq. ID No.  
3156, Seq. ID No. 3158, Seq. ID No. 3160, Seq. ID No. 3162, Seq. ID No. 3166, Seq. ID  
20 No. 3172, Seq. ID No. 3178, Seq. ID No. 3180, Seq. ID No. 3184, Seq. ID No. 3186,  
Seq. ID No. 3190, Seq. ID No. 3192, Seq. ID No. 3198, Seq. ID No. 3204, Seq. ID No.  
3206, Seq. ID No. 3212, Seq. ID No. 3218, Seq. ID No. 3222, Seq. ID No. 3228, Seq. ID  
No. 3230, Seq. ID No. 3234, Seq. ID No. 3236, Seq. ID No. 3240, Seq. ID No. 3250,  
Seq. ID No. 3252, Seq. ID No. 3254, Seq. ID No. 3258, Seq. ID No. 3260, Seq. ID No.  
25 3264, Seq. ID No. 3266, Seq. ID No. 3272, Seq. ID No. 3274, Seq. ID No. 3278, Seq. ID  
No. 3284, Seq. ID No. 3286, Seq. ID No. 3288, Seq. ID No. 3290, Seq. ID No. 3294,  
Seq. ID No. 3296, Seq. ID No. 3300, Seq. ID No. 3304, Seq. ID No. 3308, Seq. ID No.  
3314, Seq. ID No. 3316, Seq. ID No. 3320, Seq. ID No. 3324, Seq. ID No. 3330, Seq. ID  
No. 3336, Seq. ID No. 3338, Seq. ID No. 3348, Seq. ID No. 3356, Seq. ID No. 3360,  
30 Seq. ID No. 3364, Seq. ID No. 3368, Seq. ID No. 3378, Seq. ID No. 3380, Seq. ID No.  
3384, Seq. ID No. 3388, Seq. ID No. 3400, Seq. ID No. 3402, Seq. ID No. 3404, Seq. ID  
No. 3410, Seq. ID No. 3414, Seq. ID No. 3416, Seq. ID No. 3418, Seq. ID No. 3426,  
Seq. ID No. 3428, Seq. ID No. 3432, Seq. ID No. 3436, Seq. ID No. 3438, Seq. ID No.

3440, Seq. ID No. 3448, Seq. ID No. 3460, Seq. ID No. 3462, Seq. ID No. 3468, Seq. ID  
No. 3470, Seq. ID No. 3472, Seq. ID No. 3474, Seq. ID No. 3476, Seq. ID No. 3480,  
Seq. ID No. 3484, Seq. ID No. 3486, Seq. ID No. 3488, Seq. ID No. 3496, Seq. ID No.  
3502, Seq. ID No. 3506, Seq. ID No. 3508, Seq. ID No. 3510, Seq. ID No. 3512, Seq. ID  
5 No. 3520, Seq. ID No. 3522, Seq. ID No. 3526, Seq. ID No. 3530, Seq. ID No. 3534,  
Seq. ID No. 3538, Seq. ID No. 3544, Seq. ID No. 3550, Seq. ID No. 3554, Seq. ID No.  
3562, Seq. ID No. 3566, Seq. ID No. 3570, Seq. ID No. 3576, Seq. ID No. 3580, Seq. ID  
No. 3584, Seq. ID No. 3586, Seq. ID No. 3590, Seq. ID No. 3600, Seq. ID No. 3606,  
Seq. ID No. 3608, Seq. ID No. 3610, Seq. ID No. 3612, Seq. ID No. 3616, Seq. ID No.  
10 3620, Seq. ID No. 3630, Seq. ID No. 3636, Seq. ID No. 3640, Seq. ID No. 3642, Seq. ID  
No. 3644, Seq. ID No. 3646, Seq. ID No. 3652, Seq. ID No. 3654, Seq. ID No. 3660,  
Seq. ID No. 3664, Seq. ID No. 3666, Seq. ID No. 3668, Seq. ID No. 3670, Seq. ID No.  
3676, Seq. ID No. 3682, Seq. ID No. 3690, Seq. ID No. 3696, Seq. ID No. 3700, Seq. ID  
No. 3710, Seq. ID No. 3716, Seq. ID No. 3722, Seq. ID No. 3728, Seq. ID No. 3730,  
15 Seq. ID No. 3734, Seq. ID No. 3736, Seq. ID No. 3740, Seq. ID No. 3742, Seq. ID No.  
3748, Seq. ID No. 3752, Seq. ID No. 3760, Seq. ID No. 3772, Seq. ID No. 3776, Seq. ID  
No. 3780, Seq. ID No. 3784, Seq. ID No. 3792, Seq. ID No. 3798, Seq. ID No. 3804,  
Seq. ID No. 3806, Seq. ID No. 3812, Seq. ID No. 3814, Seq. ID No. 3820, Seq. ID No.  
3824, Seq. ID No. 3826, Seq. ID No. 3834, Seq. ID No. 3836, Seq. ID No. 3844, Seq. ID  
20 No. 3848, Seq. ID No. 3856, Seq. ID No. 3858, Seq. ID No. 3864, Seq. ID No. 3868,  
Seq. ID No. 3874, Seq. ID No. 3878, Seq. ID No. 3882, Seq. ID No. 3884, Seq. ID No.  
3886, Seq. ID No. 3894, Seq. ID No. 3898, Seq. ID No. 3902, Seq. ID No. 3908, Seq. ID  
No. 3914, Seq. ID No. 3916, Seq. ID No. 3918, Seq. ID No. 3920, Seq. ID No. 3926,  
Seq. ID No. 3930, Seq. ID No. 3934, Seq. ID No. 3936, Seq. ID No. 3938, Seq. ID No.  
25 3942, Seq. ID No. 3944, Seq. ID No. 3946, Seq. ID No. 3950, Seq. ID No. 3952, Seq. ID  
No. 3956, Seq. ID No. 3958, Seq. ID No. 3972, Seq. ID No. 3976, Seq. ID No. 3984,  
Seq. ID No. 3986, Seq. ID No. 3988, Seq. ID No. 3992, Seq. ID No. 4004, Seq. ID No.  
4010, Seq. ID No. 4014, Seq. ID No. 4016, Seq. ID No. 4018, Seq. ID No. 4022, Seq. ID  
No. 4024, Seq. ID No. 4030, Seq. ID No. 4032, Seq. ID No. 4036, Seq. ID No. 4038,  
30 Seq. ID No. 4040, Seq. ID No. 4050, Seq. ID No. 4056, Seq. ID No. 4058, Seq. ID No.  
4062, Seq. ID No. 4064, Seq. ID No. 4068, Seq. ID No. 4070, Seq. ID No. 4076, Seq. ID  
No. 4078, Seq. ID No. 4080, Seq. ID No. 4088, Seq. ID No. 4090, Seq. ID No. 4096,  
Seq. ID No. 4098, Seq. ID No. 4100, Seq. ID No. 4106, Seq. ID No. 4112, Seq. ID No.

4118, Seq. ID No. 4122, Seq. ID No. 4124, Seq. ID No. 4128, Seq. ID No. 4130, Seq. ID  
No. 4134, Seq. ID No. 4138, Seq. ID No. 4146, Seq. ID No. 4150, Seq. ID No. 4158,  
Seq. ID No. 4162, Seq. ID No. 4164, Seq. ID No. 4168, Seq. ID No. 4174, Seq. ID No.  
4180, Seq. ID No. 4186, Seq. ID No. 4192, Seq. ID No. 4194, Seq. ID No. 4196, Seq. ID  
5 No. 4198, Seq. ID No. 4200, Seq. ID No. 4202, Seq. ID No. 4204, Seq. ID No. 4206,  
Seq. ID No. 4212, Seq. ID No. 4216, Seq. ID No. 4218, Seq. ID No. 4220, Seq. ID No.  
4236, Seq. ID No. 4238, Seq. ID No. 4240, Seq. ID No. 4244, Seq. ID No. 4252, Seq. ID  
No. 4256, Seq. ID No. 4264, Seq. ID No. 4268, Seq. ID No. 4272, Seq. ID No. 4274,  
Seq. ID No. 4280, Seq. ID No. 4282, Seq. ID No. 4284, Seq. ID No. 4292, Seq. ID No.  
10 4296, Seq. ID No. 4300, Seq. ID No. 4302, Seq. ID No. 4304, Seq. ID No. 4308, Seq. ID  
No. 4310, Seq. ID No. 4314, Seq. ID No. 4318, Seq. ID No. 4324, Seq. ID No. 4326,  
Seq. ID No. 4330, Seq. ID No. 4332, Seq. ID No. 4334, Seq. ID No. 4340, Seq. ID No.  
4344, Seq. ID No. 4348, Seq. ID No. 4354, Seq. ID No. 4356, Seq. ID No. 4358, Seq. ID  
No. 4366, Seq. ID No. 4370, Seq. ID No. 4374, Seq. ID No. 4376, Seq. ID No. 4378,  
15 Seq. ID No. 4380, Seq. ID No. 4382, Seq. ID No. 4384, Seq. ID No. 4392, Seq. ID No.  
4394, Seq. ID No. 4398, Seq. ID No. 4402, Seq. ID No. 4412, Seq. ID No. 4418, Seq. ID  
No. 4424, Seq. ID No. 4432, Seq. ID No. 4434, Seq. ID No. 4436, Seq. ID No. 4444,  
Seq. ID No. 4448, Seq. ID No. 4452, Seq. ID No. 4460, Seq. ID No. 4462, Seq. ID No.  
4468, Seq. ID No. 4472, Seq. ID No. 4476, Seq. ID No. 4480, Seq. ID No. 4482, Seq. ID  
20 No. 4488, Seq. ID No. 4492, Seq. ID No. 4502, Seq. ID No. 4506, Seq. ID No. 4512,  
Seq. ID No. 4524, Seq. ID No. 4532, Seq. ID No. 4534, Seq. ID No. 4538, Seq. ID No.  
4540, Seq. ID No. 4542, Seq. ID No. 4544, Seq. ID No. 4548, Seq. ID No. 4550, Seq. ID  
No. 4560, Seq. ID No. 4566, Seq. ID No. 4568, Seq. ID No. 4572, Seq. ID No. 4576,  
Seq. ID No. 4578, Seq. ID No. 4582, Seq. ID No. 4586, Seq. ID No. 4592, Seq. ID No.  
25 4596, Seq. ID No. 4598, Seq. ID No. 4604, Seq. ID No. 4608, Seq. ID No. 4610, Seq. ID  
No. 4612, Seq. ID No. 4616, Seq. ID No. 4624, Seq. ID No. 4628, Seq. ID No. 4632,  
Seq. ID No. 4636, Seq. ID No. 4638, Seq. ID No. 4644, Seq. ID No. 4650, Seq. ID No.  
4652, Seq. ID No. 4654, Seq. ID No. 4658, Seq. ID No. 4662, Seq. ID No. 4664, Seq. ID  
No. 4670, Seq. ID No. 4672, Seq. ID No. 4674, Seq. ID No. 4680, Seq. ID No. 4686,  
30 Seq. ID No. 4694, Seq. ID No. 4698, Seq. ID No. 4704, Seq. ID No. 4706, Seq. ID No.  
4714, Seq. ID No. 4718, Seq. ID No. 4720, Seq. ID No. 4726, Seq. ID No. 4730, Seq. ID  
No. 4732, Seq. ID No. 4734, Seq. ID No. 4740, Seq. ID No. 4744, Seq. ID No. 4746,  
Seq. ID No. 4748, Seq. ID No. 4750, Seq. ID No. 4752, Seq. ID No. 4758, Seq. ID No.

4766, Seq. ID No. 4770, Seq. ID No. 4778, Seq. ID No. 4780, Seq. ID No. 4782, Seq. ID  
No. 4788, Seq. ID No. 4790, Seq. ID No. 4792, Seq. ID No. 4798, Seq. ID No. 4804,  
Seq. ID No. 4808, Seq. ID No. 4810, Seq. ID No. 4812, Seq. ID No. 4814, Seq. ID No.  
4816, Seq. ID No. 4822, Seq. ID No. 4824, Seq. ID No. 4826, Seq. ID No. 4828, Seq. ID  
5 No. 4834, Seq. ID No. 4836, Seq. ID No. 4838, Seq. ID No. 4844, Seq. ID No. 4846,  
Seq. ID No. 4848, Seq. ID No. 4850, Seq. ID No. 4860, Seq. ID No. 4862, Seq. ID No.  
4866, Seq. ID No. 4868, Seq. ID No. 4876, Seq. ID No. 4878, Seq. ID No. 4880, Seq. ID  
No. 4882, Seq. ID No. 4884, Seq. ID No. 4886, Seq. ID No. 4888, Seq. ID No. 4894,  
Seq. ID No. 4900, Seq. ID No. 4902, Seq. ID No. 4904, Seq. ID No. 4906, Seq. ID No.  
10 4908, Seq. ID No. 4912, Seq. ID No. 4916, Seq. ID No. 4918, Seq. ID No. 4920, Seq. ID  
No. 4922, Seq. ID No. 4928, Seq. ID No. 4932, Seq. ID No. 4936, Seq. ID No. 4940,  
Seq. ID No. 4942, Seq. ID No. 4944, Seq. ID No. 4946, Seq. ID No. 4948, Seq. ID No.  
4954, Seq. ID No. 4958, Seq. ID No. 4960, Seq. ID No. 4964, Seq. ID No. 4966, Seq. ID  
No. 4970, Seq. ID No. 4972, Seq. ID No. 4974, Seq. ID No. 4980, Seq. ID No. 4986,  
15 Seq. ID No. 4990, Seq. ID No. 4992, Seq. ID No. 4996, Seq. ID No. 4998, Seq. ID No.  
5002, Seq. ID No. 5008, Seq. ID No. 5010, Seq. ID No. 5018, Seq. ID No. 5022, Seq. ID  
No. 5028, Seq. ID No. 5030, Seq. ID No. 5040, Seq. ID No. 5048, Seq. ID No. 5052,  
Seq. ID No. 5054, Seq. ID No. 5056, Seq. ID No. 5060, Seq. ID No. 5062, Seq. ID No.  
5070, Seq. ID No. 5078, Seq. ID No. 5080, Seq. ID No. 5082, Seq. ID No. 5084, Seq. ID  
20 No. 5088, Seq. ID No. 5092, Seq. ID No. 5094, Seq. ID No. 5098, Seq. ID No. 5104,  
Seq. ID No. 5106, Seq. ID No. 5110, Seq. ID No. 5112, Seq. ID No. 5114, Seq. ID No.  
5116, Seq. ID No. 5118, Seq. ID No. 5128, Seq. ID No. 5142, Seq. ID No. 5146, Seq. ID  
No. 5150, Seq. ID No. 5154, Seq. ID No. 5158, Seq. ID No. 5166, Seq. ID No. 5170,  
Seq. ID No. 5172, Seq. ID No. 5178, Seq. ID No. 5184, Seq. ID No. 5186, Seq. ID No.  
25 5188, Seq. ID No. 5194, Seq. ID No. 5196, Seq. ID No. 5202, Seq. ID No. 5204, Seq. ID  
No. 5206, Seq. ID No. 5210, Seq. ID No. 5212, Seq. ID No. 5216, Seq. ID No. 5220,  
Seq. ID No. 5228, Seq. ID No. 5232, Seq. ID No. 5236, Seq. ID No. 5238, Seq. ID No.  
5240, Seq. ID No. 5244, Seq. ID No. 5246, Seq. ID No. 5248, Seq. ID No. 5254, Seq. ID  
No. 5256, Seq. ID No. 5258, Seq. ID No. 5262, Seq. ID No. 5264, Seq. ID No. 5272,  
30 Seq. ID No. 5276, Seq. ID No. 5284, Seq. ID No. 5292, Seq. ID No. 5300, Seq. ID No.  
5306, Seq. ID No. 5310, Seq. ID No. 5312, Seq. ID No. 5314, Seq. ID No. 5320, Seq. ID  
No. 5324, Seq. ID No. 5326, Seq. ID No. 5336, Seq. ID No. 5338, Seq. ID No. 5342,  
Seq. ID No. 5346, Seq. ID No. 5352, Seq. ID No. 5356, Seq. ID No. 5364, Seq. ID No.



5366, Seq. ID No. 5368, Seq. ID No. 5372, Seq. ID No. 5374, Seq. ID No. 5382, Seq. ID No. 5384, Seq. ID No. 5388, Seq. ID No. 5390, Seq. ID No. 5392, Seq. ID No. 5394, Seq. ID No. 5396, Seq. ID No. 5398, Seq. ID No. 5400, Seq. ID No. 5402, Seq. ID No. 5404, Seq. ID No. 5410, Seq. ID No. 5412, Seq. ID No. 5416, Seq. ID No. 5418, Seq. ID No. 5420, Seq. ID No. 5422, Seq. ID No. 5424, Seq. ID No. 5428, Seq. ID No. 5432, Seq. ID No. 5434, Seq. ID No. 5440, Seq. ID No. 5442, Seq. ID No. 5444, Seq. ID No. 5448, Seq. ID No. 5450, Seq. ID No. 5452, Seq. ID No. 5454, Seq. ID No. 5456, Seq. ID No. 5458, Seq. ID No. 5474, Seq. ID No. 5478, Seq. ID No. 5484, Seq. ID No. 5488, Seq. ID No. 5492, Seq. ID No. 5496, Seq. ID No. 5500, Seq. ID No. 5504, Seq. ID No. 5508, Seq. ID No. 5510, Seq. ID No. 5514, Seq. ID No. 5528, Seq. ID No. 5532, Seq. ID No. 5538, Seq. ID No. 5540, Seq. ID No. 5542, Seq. ID No. 5548, Seq. ID No. 5554, Seq. ID No. 5558, Seq. ID No. 5560, Seq. ID No. 5564, Seq. ID No. 5568, Seq. ID No. 5572, Seq. ID No. 5576, Seq. ID No. 5582, Seq. ID No. 5586, Seq. ID No. 5592, Seq. ID No. 5600, Seq. ID No. 5602, Seq. ID No. 5606, Seq. ID No. 5616, Seq. ID No. 5622, Seq. ID No. 5630, Seq. ID No. 5632, Seq. ID No. 5638, Seq. ID No. 5648, Seq. ID No. 5652, Seq. ID No. 5656, Seq. ID No. 5658, Seq. ID No. 5662, Seq. ID No. 5666, Seq. ID No. 5670, Seq. ID No. 5672, Seq. ID No. 5674, Seq. ID No. 5680, Seq. ID No. 5686, Seq. ID No. 5694, Seq. ID No. 5698, Seq. ID No. 5700, Seq. ID No. 5702, Seq. ID No. 5708, Seq. ID No. 5716, Seq. ID No. 5718, Seq. ID No. 5724, Seq. ID No. 5728, Seq. ID No. 5736, Seq. ID No. 5740, Seq. ID No. 5750, Seq. ID No. 5752, Seq. ID No. 5756, Seq. ID No. 5762, Seq. ID No. 5772, Seq. ID No. 5776, Seq. ID No. 5778, Seq. ID No. 5780, Seq. ID No. 5784, Seq. ID No. 5790, Seq. ID No. 5796, Seq. ID No. 5802, Seq. ID No. 5804, Seq. ID No. 5810, Seq. ID No. 5816, Seq. ID No. 5820, Seq. ID No. 5826, Seq. ID No. 5834, Seq. ID No. 5836, Seq. ID No. 5842, Seq. ID No. 5846, Seq. ID No. 5848, Seq. ID No. 5850, Seq. ID No. 5852, Seq. ID No. 5854, Seq. ID No. 5856, Seq. ID No. 5860, Seq. ID No. 5866, Seq. ID No. 5872, Seq. ID No. 5876, Seq. ID No. 5878, Seq. ID No. 5882, Seq. ID No. 5888, Seq. ID No. 5892, Seq. ID No. 5896, Seq. ID No. 5898, Seq. ID No. 5902, Seq. ID No. 5904, Seq. ID No. 5912, Seq. ID No. 5914, Seq. ID No. 5916, Seq. ID No. 5918, Seq. ID No. 5920, Seq. ID No. 5930, Seq. ID No. 5932, Seq. ID No. 5934, Seq. ID No. 5938, Seq. ID No. 5942, Seq. ID No. 5944, Seq. ID No. 5948, Seq. ID No. 5952, Seq. ID No. 5954, Seq. ID No. 5956, Seq. ID No. 5958, Seq. ID No. 5962, Seq. ID No. 5970, Seq. ID No. 5974, Seq. ID No. 5980, Seq. ID No. 5982, Seq. ID No. 5986, Seq. ID No. 5990, Seq. ID No. 5994, Seq. ID No. 6002, Seq. ID No.

6004, Seq. ID No. 6012, Seq. ID No. 6016, Seq. ID No. 6018, Seq. ID No. 6022, Seq. ID No. 6028, Seq. ID No. 6030, Seq. ID No. 6034, Seq. ID No. 6036, Seq. ID No. 6042, Seq. ID No. 6044, Seq. ID No. 6054, Seq. ID No. 6058, Seq. ID No. 6066, Seq. ID No. 6072, Seq. ID No. 6080, Seq. ID No. 6086, Seq. ID No. 6090, Seq. ID No. 6096, Seq. ID No. 6098, Seq. ID No. 6102, Seq. ID No. 6104, Seq. ID No. 6112, Seq. ID No. 6114, Seq. ID No. 6118, Seq. ID No. 6124, Seq. ID No. 6126, Seq. ID No. 6130, Seq. ID No. 6132, Seq. ID No. 6134, Seq. ID No. 6142, Seq. ID No. 6146, Seq. ID No. 6150, Seq. ID No. 6158, Seq. ID No. 6166, Seq. ID No. 6170, Seq. ID No. 6172, Seq. ID No. 6176, Seq. ID No. 6178, Seq. ID No. 6182, Seq. ID No. 6188, Seq. ID No. 6196, Seq. ID No. 6202, Seq. ID No. 6210, Seq. ID No. 6214, Seq. ID No. 6216, Seq. ID No. 6220, Seq. ID No. 6234, Seq. ID No. 6236, Seq. ID No. 6244, Seq. ID No. 6250, Seq. ID No. 6252, Seq. ID No. 6258, Seq. ID No. 6262, Seq. ID No. 6264, Seq. ID No. 6272, Seq. ID No. 6276, Seq. ID No. 6278, Seq. ID No. 6282, Seq. ID No. 6288, Seq. ID No. 6298, Seq. ID No. 6300, Seq. ID No. 6306, Seq. ID No. 6312, Seq. ID No. 6316, Seq. ID No. 6322, Seq. ID No. 6324, Seq. ID No. 6328, Seq. ID No. 6332, Seq. ID No. 6334, Seq. ID No. 6338, Seq. ID No. 6340, Seq. ID No. 6342, Seq. ID No. 6344, Seq. ID No. 6346, Seq. ID No. 6354, Seq. ID No. 6358, Seq. ID No. 6360, Seq. ID No. 6362, Seq. ID No. 6368, Seq. ID No. 6370, Seq. ID No. 6374, Seq. ID No. 6376, Seq. ID No. 6378, Seq. ID No. 6380, Seq. ID No. 6390, Seq. ID No. 6396, Seq. ID No. 6400, Seq. ID No. 6404, Seq. ID No. 6408, Seq. ID No. 6412, Seq. ID No. 6414, Seq. ID No. 6418, Seq. ID No. 6424, Seq. ID No. 6434, Seq. ID No. 6438, Seq. ID No. 6440, Seq. ID No. 6446, Seq. ID No. 6450, Seq. ID No. 6452, Seq. ID No. 6458, Seq. ID No. 6460, Seq. ID No. 6462, Seq. ID No. 6464, Seq. ID No. 6478, Seq. ID No. 6482, Seq. ID No. 6484, Seq. ID No. 6488, Seq. ID No. 6490, Seq. ID No. 6492, Seq. ID No. 6494, Seq. ID No. 6496, Seq. ID No. 6504, Seq. ID No. 6506, Seq. ID No. 6512, Seq. ID No. 6516, Seq. ID No. 6520, Seq. ID No. 6524, Seq. ID No. 6526, Seq. ID No. 6530, Seq. ID No. 6532, Seq. ID No. 6534, Seq. ID No. 6538, Seq. ID No. 6546, Seq. ID No. 6552, Seq. ID No. 6554, Seq. ID No. 6560, Seq. ID No. 6564, Seq. ID No. 6568, Seq. ID No. 6578, Seq. ID No. 6580, Seq. ID No. 6584, Seq. ID No. 6586, Seq. ID No. 6588, Seq. ID No. 6590, Seq. ID No. 6604, Seq. ID No. 6606, Seq. ID No. 6610, Seq. ID No. 6614, Seq. ID No. 6616, Seq. ID No. 6618, Seq. ID No. 6622, Seq. ID No. 6624, Seq. ID No. 6628, Seq. ID No. 6630, Seq. ID No. 6634, and Seq. ID No. 6640.

In yet another preferred embodiment, the polypeptide is selected from the *Alloicoccus otitidis* polypeptides identified by GeneMark™ ORF finder program, and is selected from one of Seq. ID No. 2, Seq. ID No. 4, Seq. ID No. 12, Seq. ID No. 14, Seq. ID No. 16, Seq. ID No. 18, Seq. ID No. 26, Seq. ID No. 28, Seq. ID No. 30, Seq. ID No. 36, Seq. ID No. 38, Seq. ID No. 40, Seq. ID No. 42, Seq. ID No. 44, Seq. ID No. 46, Seq. ID No. 50, Seq. ID No. 54, Seq. ID No. 58, Seq. ID No. 62, Seq. ID No. 70, Seq. ID No. 72, Seq. ID No. 76, Seq. ID No. 82, Seq. ID No. 84, Seq. ID No. 90, Seq. ID No. 96, Seq. ID No. 102, Seq. ID No. 112, Seq. ID No. 120, Seq. ID No. 126, Seq. ID No. 130, Seq. ID No. 136, Seq. ID No. 138, Seq. ID No. 142, Seq. ID No. 148, Seq. ID No. 152, Seq. ID No. 156, Seq. ID No. 168, Seq. ID No. 172, Seq. ID No. 182, Seq. ID No. 186, Seq. ID No. 188, Seq. ID No. 190, Seq. ID No. 192, Seq. ID No. 196, Seq. ID No. 200, Seq. ID No. 208, Seq. ID No. 214, Seq. ID No. 220, Seq. ID No. 222, Seq. ID No. 226, Seq. ID No. 228, Seq. ID No. 230, Seq. ID No. 234, Seq. ID No. 240, Seq. ID No. 242, Seq. ID No. 244, Seq. ID No. 254, Seq. ID No. 262, Seq. ID No. 264, Seq. ID No. 268, Seq. ID No. 274, Seq. ID No. 276, Seq. ID No. 278, Seq. ID No. 280, Seq. ID No. 292, Seq. ID No. 294, Seq. ID No. 296, Seq. ID No. 300, Seq. ID No. 304, Seq. ID No. 310, Seq. ID No. 312, Seq. ID No. 316, Seq. ID No. 320, Seq. ID No. 324, Seq. ID No. 332, Seq. ID No. 342, Seq. ID No. 346, Seq. ID No. 352, Seq. ID No. 356, Seq. ID No. 362, Seq. ID No. 364, Seq. ID No. 366, Seq. ID No. 376, Seq. ID No. 380, Seq. ID No. 382, Seq. ID No. 384, Seq. ID No. 390, Seq. ID No. 392, Seq. ID No. 396, Seq. ID No. 400, Seq. ID No. 406, Seq. ID No. 410, Seq. ID No. 414, Seq. ID No. 418, Seq. ID No. 422, Seq. ID No. 424, Seq. ID No. 426, Seq. ID No. 428, Seq. ID No. 430, Seq. ID No. 436, Seq. ID No. 438, Seq. ID No. 440, Seq. ID No. 442, Seq. ID No. 444, Seq. ID No. 446, Seq. ID No. 448, Seq. ID No. 450, Seq. ID No. 460, Seq. ID No. 466, Seq. ID No. 486, Seq. ID No. 502, Seq. ID No. 506, Seq. ID No. 512, Seq. ID No. 514, Seq. ID No. 518, Seq. ID No. 520, Seq. ID No. 524, Seq. ID No. 530, Seq. ID No. 534, Seq. ID No. 536, Seq. ID No. 542, Seq. ID No. 544, Seq. ID No. 552, Seq. ID No. 554, Seq. ID No. 560, Seq. ID No. 564, Seq. ID No. 570, Seq. ID No. 576, Seq. ID No. 580, Seq. ID No. 584, Seq. ID No. 592, Seq. ID No. 596, Seq. ID No. 602, Seq. ID No. 606, Seq. ID No. 608, Seq. ID No. 612, Seq. ID No. 614, Seq. ID No. 616, Seq. ID No. 622, Seq. ID No. 628, Seq. ID No. 630, Seq. ID No. 634, Seq. ID No. 636, Seq. ID No. 638, Seq. ID No. 644, Seq. ID No. 650, Seq. ID No. 652, Seq. ID No. 656, Seq. ID No. 658, Seq. ID No. 670, Seq. ID No. 672, Seq. ID No. 676, Seq. ID No. 682, Seq. ID No. 684, Seq. ID No. 686, Seq. ID

No. 694, Seq. ID No. 704, Seq. ID No. 706, Seq. ID No. 712, Seq. ID No. 726, Seq. ID No. 732, Seq. ID No. 736, Seq. ID No. 738, Seq. ID No. 742, Seq. ID No. 744, Seq. ID No. 750, Seq. ID No. 754, Seq. ID No. 760, Seq. ID No. 774, Seq. ID No. 782, Seq. ID No. 784, Seq. ID No. 786, Seq. ID No. 790, Seq. ID No. 794, Seq. ID No. 798, Seq. ID No. 804, Seq. ID No. 816, Seq. ID No. 820, Seq. ID No. 822, Seq. ID No. 828, Seq. ID No. 832, Seq. ID No. 834, Seq. ID No. 836, Seq. ID No. 838, Seq. ID No. 842, Seq. ID No. 844, Seq. ID No. 850, Seq. ID No. 852, Seq. ID No. 854, Seq. ID No. 858, Seq. ID No. 866, Seq. ID No. 870, Seq. ID No. 874, Seq. ID No. 878, Seq. ID No. 884, Seq. ID No. 888, Seq. ID No. 892, Seq. ID No. 896, Seq. ID No. 902, Seq. ID No. 908, Seq. ID No. 912, Seq. ID No. 918, Seq. ID No. 922, Seq. ID No. 928, Seq. ID No. 936, Seq. ID No. 940, Seq. ID No. 946, Seq. ID No. 952, Seq. ID No. 954, Seq. ID No. 960, Seq. ID No. 964, Seq. ID No. 968, Seq. ID No. 970, Seq. ID No. 978, Seq. ID No. 990, Seq. ID No. 996, Seq. ID No. 1000, Seq. ID No. 1006, Seq. ID No. 1008, Seq. ID No. 1016, Seq. ID No. 1022, Seq. ID No. 1036, Seq. ID No. 1042, Seq. ID No. 1044, Seq. ID No. 1050, Seq. ID No. 1054, Seq. ID No. 1058, Seq. ID No. 1060, Seq. ID No. 1064, Seq. ID No. 1068, Seq. ID No. 1070, Seq. ID No. 1072, Seq. ID No. 1076, Seq. ID No. 1084, Seq. ID No. 1086, Seq. ID No. 1090, Seq. ID No. 1094, Seq. ID No. 1098, Seq. ID No. 1100, Seq. ID No. 1102, Seq. ID No. 1110, Seq. ID No. 1114, Seq. ID No. 1118, Seq. ID No. 1122, Seq. ID No. 1130, Seq. ID No. 1134, Seq. ID No. 1138, Seq. ID No. 1142, Seq. ID No. 1146, Seq. ID No. 1150, Seq. ID No. 1156, Seq. ID No. 1158, Seq. ID No. 1160, Seq. ID No. 1164, Seq. ID No. 1172, Seq. ID No. 1174, Seq. ID No. 1176, Seq. ID No. 1182, Seq. ID No. 1186, Seq. ID No. 1190, Seq. ID No. 1200, Seq. ID No. 1206, Seq. ID No. 1210, Seq. ID No. 1216, Seq. ID No. 1220, Seq. ID No. 1224, Seq. ID No. 1226, Seq. ID No. 1234, Seq. ID No. 1236, Seq. ID No. 1242, Seq. ID No. 1252, Seq. ID No. 1256, Seq. ID No. 1262, Seq. ID No. 1272, Seq. ID No. 1282, Seq. ID No. 1316, Seq. ID No. 1324, Seq. ID No. 1332, Seq. ID No. 1334, Seq. ID No. 1340, Seq. ID No. 1346, Seq. ID No. 1348, Seq. ID No. 1356, Seq. ID No. 1358, Seq. ID No. 1370, Seq. ID No. 1374, Seq. ID No. 1388, Seq. ID No. 1392, Seq. ID No. 1396, Seq. ID No. 1398, Seq. ID No. 1404, Seq. ID No. 1406, Seq. ID No. 1408, Seq. ID No. 1414, Seq. ID No. 1416, Seq. ID No. 1418, Seq. ID No. 1426, Seq. ID No. 1428, Seq. ID No. 1430, Seq. ID No. 1432, Seq. ID No. 1434, Seq. ID No. 1436, Seq. ID No. 1440, Seq. ID No. 1442, Seq. ID No. 1452, Seq. ID No. 1454, Seq. ID No. 1460, Seq. ID No. 1462, Seq. ID No. 1470, Seq. ID No. 1472, Seq. ID No. 1474, Seq. ID No. 1476, Seq. ID No. 1478, Seq. ID No.

1484, Seq. ID No. 1488, Seq. ID No. 1490, Seq. ID No. 1494, Seq. ID No. 1496, Seq. ID  
No. 1498, Seq. ID No. 1502, Seq. ID No. 1504, Seq. ID No. 1508, Seq. ID No. 1510,  
Seq. ID No. 1518, Seq. ID No. 1522, Seq. ID No. 1528, Seq. ID No. 1532, Seq. ID No.  
1538, Seq. ID No. 1542, Seq. ID No. 1544, Seq. ID No. 1550, Seq. ID No. 1562, Seq. ID  
5 No. 1564, Seq. ID No. 1566, Seq. ID No. 1570, Seq. ID No. 1574, Seq. ID No. 1576,  
Seq. ID No. 1582, Seq. ID No. 1588, Seq. ID No. 1592, Seq. ID No. 1596, Seq. ID No.  
1598, Seq. ID No. 1606, Seq. ID No. 1610, Seq. ID No. 1614, Seq. ID No. 1620, Seq. ID  
No. 1624, Seq. ID No. 1628, Seq. ID No. 1630, Seq. ID No. 1636, Seq. ID No. 1642,  
Seq. ID No. 1648, Seq. ID No. 1652, Seq. ID No. 1658, Seq. ID No. 1660, Seq. ID No.  
10 1668, Seq. ID No. 1670, Seq. ID No. 1680, Seq. ID No. 1684, Seq. ID No. 1688, Seq. ID  
No. 1692, Seq. ID No. 1698, Seq. ID No. 1700, Seq. ID No. 1702, Seq. ID No. 1708,  
Seq. ID No. 1710, Seq. ID No. 1714, Seq. ID No. 1718, Seq. ID No. 1722, Seq. ID No.  
1726, Seq. ID No. 1736, Seq. ID No. 1738, Seq. ID No. 1740, Seq. ID No. 1744, Seq. ID  
No. 1746, Seq. ID No. 1750, Seq. ID No. 1756, Seq. ID No. 1770, Seq. ID No. 1774,  
15 Seq. ID No. 1778, Seq. ID No. 1786, Seq. ID No. 1790, Seq. ID No. 1792, Seq. ID No.  
1798, Seq. ID No. 1800, Seq. ID No. 1804, Seq. ID No. 1806, Seq. ID No. 1808, Seq. ID  
No. 1818, Seq. ID No. 1820, Seq. ID No. 1822, Seq. ID No. 1826, Seq. ID No. 1828,  
Seq. ID No. 1832, Seq. ID No. 1836, Seq. ID No. 1842, Seq. ID No. 1846, Seq. ID No.  
1848, Seq. ID No. 1850, Seq. ID No. 1852, Seq. ID No. 1856, Seq. ID No. 1860, Seq. ID  
20 No. 1862, Seq. ID No. 1866, Seq. ID No. 1868, Seq. ID No. 1872, Seq. ID No. 1874,  
Seq. ID No. 1878, Seq. ID No. 1880, Seq. ID No. 1888, Seq. ID No. 1890, Seq. ID No.  
1896, Seq. ID No. 1898, Seq. ID No. 1900, Seq. ID No. 1902, Seq. ID No. 1906, Seq. ID  
No. 1910, Seq. ID No. 1918, Seq. ID No. 1922, Seq. ID No. 1926, Seq. ID No. 1932,  
Seq. ID No. 1934, Seq. ID No. 1938, Seq. ID No. 1940, Seq. ID No. 1946, Seq. ID No.  
25 1948, Seq. ID No. 1952, Seq. ID No. 1956, Seq. ID No. 1960, Seq. ID No. 1962, Seq. ID  
No. 1966, Seq. ID No. 1968, Seq. ID No. 1970, Seq. ID No. 1974, Seq. ID No. 1978,  
Seq. ID No. 1980, Seq. ID No. 1984, Seq. ID No. 1990, Seq. ID No. 1992, Seq. ID No.  
1998, Seq. ID No. 2002, Seq. ID No. 2004, Seq. ID No. 2012, Seq. ID No. 2022, Seq. ID  
No. 2024, Seq. ID No. 2030, Seq. ID No. 2034, Seq. ID No. 2038, Seq. ID No. 2040,  
30 Seq. ID No. 2046, Seq. ID No. 2048, Seq. ID No. 2052, Seq. ID No. 2058, Seq. ID No.  
2062, Seq. ID No. 2068, Seq. ID No. 2070, Seq. ID No. 2072, Seq. ID No. 2074, Seq. ID  
No. 2078, Seq. ID No. 2090, Seq. ID No. 2094, Seq. ID No. 2096, Seq. ID No. 2100,  
Seq. ID No. 2102, Seq. ID No. 2114, Seq. ID No. 2118, Seq. ID No. 2124, Seq. ID No.

2136, Seq. ID No. 2138, Seq. ID No. 2140, Seq. ID No. 2144, Seq. ID No. 2148, Seq. ID  
No. 2154, Seq. ID No. 2160, Seq. ID No. 2164, Seq. ID No. 2168, Seq. ID No. 2176,  
Seq. ID No. 2182, Seq. ID No. 2186, Seq. ID No. 2190, Seq. ID No. 2194, Seq. ID No.  
2196, Seq. ID No. 2198, Seq. ID No. 2206, Seq. ID No. 2218, Seq. ID No. 2220, Seq. ID  
5 No. 2224, Seq. ID No. 2226, Seq. ID No. 2230, Seq. ID No. 2236, Seq. ID No. 2240,  
Seq. ID No. 2244, Seq. ID No. 2246, Seq. ID No. 2248, Seq. ID No. 2254, Seq. ID No.  
2256, Seq. ID No. 2258, Seq. ID No. 2260, Seq. ID No. 2262, Seq. ID No. 2266, Seq. ID  
No. 2270, Seq. ID No. 2274, Seq. ID No. 2286, Seq. ID No. 2298, Seq. ID No. 2300,  
Seq. ID No. 2302, Seq. ID No. 2314, Seq. ID No. 2328, Seq. ID No. 2332, Seq. ID No.  
10 2336, Seq. ID No. 2338, Seq. ID No. 2342, Seq. ID No. 2344, Seq. ID No. 2346, Seq. ID  
No. 2350, Seq. ID No. 2352, Seq. ID No. 2358, Seq. ID No. 2360, Seq. ID No. 2362,  
Seq. ID No. 2366, Seq. ID No. 2370, Seq. ID No. 2374, Seq. ID No. 2378, Seq. ID No.  
2384, Seq. ID No. 2398, Seq. ID No. 2402, Seq. ID No. 2404, Seq. ID No. 2410, Seq. ID  
No. 2412, Seq. ID No. 2418, Seq. ID No. 2422, Seq. ID No. 2424, Seq. ID No. 2426,  
15 Seq. ID No. 2430, Seq. ID No. 2436, Seq. ID No. 2438, Seq. ID No. 2440, Seq. ID No.  
2442, Seq. ID No. 2446, Seq. ID No. 2450, Seq. ID No. 2452, Seq. ID No. 2454, Seq. ID  
No. 2462, Seq. ID No. 2466, Seq. ID No. 2468, Seq. ID No. 2472, Seq. ID No. 2474,  
Seq. ID No. 2478, Seq. ID No. 2480, Seq. ID No. 2482, Seq. ID No. 2486, Seq. ID No.  
2488, Seq. ID No. 2496, Seq. ID No. 2506, Seq. ID No. 2508, Seq. ID No. 2510, Seq. ID  
20 No. 2520, Seq. ID No. 2526, Seq. ID No. 2528, Seq. ID No. 2530, Seq. ID No. 2536,  
Seq. ID No. 2538, Seq. ID No. 2540, Seq. ID No. 2548, Seq. ID No. 2552, Seq. ID No.  
2564, Seq. ID No. 2566, Seq. ID No. 2574, Seq. ID No. 2578, Seq. ID No. 2580, Seq. ID  
No. 2586, Seq. ID No. 2594, Seq. ID No. 2596, Seq. ID No. 2600, Seq. ID No. 2608,  
Seq. ID No. 2610, Seq. ID No. 2614, Seq. ID No. 2616, Seq. ID No. 2620, Seq. ID No.  
25 2624, Seq. ID No. 2626, Seq. ID No. 2632, Seq. ID No. 2634, Seq. ID No. 2640, Seq. ID  
No. 2642, Seq. ID No. 2644, Seq. ID No. 2648, Seq. ID No. 2652, Seq. ID No. 2656,  
Seq. ID No. 2658, Seq. ID No. 2662, Seq. ID No. 2666, Seq. ID No. 2670, Seq. ID No.  
2672, Seq. ID No. 2674, Seq. ID No. 2682, Seq. ID No. 2690, Seq. ID No. 2694, Seq. ID  
No. 2700, Seq. ID No. 2704, Seq. ID No. 2710, Seq. ID No. 2712, Seq. ID No. 2714,  
30 Seq. ID No. 2720, Seq. ID No. 2722, Seq. ID No. 2728, Seq. ID No. 2738, Seq. ID No.  
2742, Seq. ID No. 2746, Seq. ID No. 2750, Seq. ID No. 2754, Seq. ID No. 2758, Seq. ID  
No. 2762, Seq. ID No. 2766, Seq. ID No. 2768, Seq. ID No. 2770, Seq. ID No. 2774,  
Seq. ID No. 2776, Seq. ID No. 2778, Seq. ID No. 2788, Seq. ID No. 2790, Seq. ID No.

2792, Seq. ID No. 2794, Seq. ID No. 2796, Seq. ID No. 2800, Seq. ID No. 2804, Seq. ID No. 2816, Seq. ID No. 2818, Seq. ID No. 2820, Seq. ID No. 2826, Seq. ID No. 2844, Seq. ID No. 2848, Seq. ID No. 2850, Seq. ID No. 2852, Seq. ID No. 2858, Seq. ID No. 2860, Seq. ID No. 2864, Seq. ID No. 2868, Seq. ID No. 2870, Seq. ID No. 2872, Seq. ID No. 2878, Seq. ID No. 2880, Seq. ID No. 2890, Seq. ID No. 2892, Seq. ID No. 2898, Seq. ID No. 2902, Seq. ID No. 2904, Seq. ID No. 2908, Seq. ID No. 2910, Seq. ID No. 2914, Seq. ID No. 2916, Seq. ID No. 2920, Seq. ID No. 2922, Seq. ID No. 2924, Seq. ID No. 2926, Seq. ID No. 2930, Seq. ID No. 2936, Seq. ID No. 2944, Seq. ID No. 2952, Seq. ID No. 2956, Seq. ID No. 2964, Seq. ID No. 2966, Seq. ID No. 2972, Seq. ID No. 2974, Seq. ID No. 2976, Seq. ID No. 2980, Seq. ID No. 2982, Seq. ID No. 2986, Seq. ID No. 2990, Seq. ID No. 2994, Seq. ID No. 3000, Seq. ID No. 3002, Seq. ID No. 3004, Seq. ID No. 3018, Seq. ID No. 3028, Seq. ID No. 3034, Seq. ID No. 3036, Seq. ID No. 3040, Seq. ID No. 3042, Seq. ID No. 3044, Seq. ID No. 3046, Seq. ID No. 3048, Seq. ID No. 3056, Seq. ID No. 3058, Seq. ID No. 3062, Seq. ID No. 3066, Seq. ID No. 3070, Seq. ID No. 3080, Seq. ID No. 3090, Seq. ID No. 3092, Seq. ID No. 3094, Seq. ID No. 3096, Seq. ID No. 3104, Seq. ID No. 3106, Seq. ID No. 3110, Seq. ID No. 3114, Seq. ID No. 3126, Seq. ID No. 3128, Seq. ID No. 3136, Seq. ID No. 3138, Seq. ID No. 3142, Seq. ID No. 3144, Seq. ID No. 3148, Seq. ID No. 3156, Seq. ID No. 3158, Seq. ID No. 3160, Seq. ID No. 3162, Seq. ID No. 3166, Seq. ID No. 3170, Seq. ID No. 3176, Seq. ID No. 3180, Seq. ID No. 3184, Seq. ID No. 3186, Seq. ID No. 3190, Seq. ID No. 3192, Seq. ID No. 3196, Seq. ID No. 3200, Seq. ID No. 3206, Seq. ID No. 3212, Seq. ID No. 3218, Seq. ID No. 3222, Seq. ID No. 3226, Seq. ID No. 3230, Seq. ID No. 3232, Seq. ID No. 3238, Seq. ID No. 3240, Seq. ID No. 3248, Seq. ID No. 3252, Seq. ID No. 3254, Seq. ID No. 3256, Seq. ID No. 3260, Seq. ID No. 3262, Seq. ID No. 3268, Seq. ID No. 3274, Seq. ID No. 3278, Seq. ID No. 3280, Seq. ID No. 3286, Seq. ID No. 3288, Seq. ID No. 3290, Seq. ID No. 3294, Seq. ID No. 3296, Seq. ID No. 3300, Seq. ID No. 3302, Seq. ID No. 3306, Seq. ID No. 3310, Seq. ID No. 3316, Seq. ID No. 3320, Seq. ID No. 3322, Seq. ID No. 3328, Seq. ID No. 3334, Seq. ID No. 3338, Seq. ID No. 3344, Seq. ID No. 3354, Seq. ID No. 3360, Seq. ID No. 3362, Seq. ID No. 3366, Seq. ID No. 3374, Seq. ID No. 3382, Seq. ID No. 3386, Seq. ID No. 3394, Seq. ID No. 3402, Seq. ID No. 3408, Seq. ID No. 3412, Seq. ID No. 3416, Seq. ID No. 3418, Seq. ID No. 3424, Seq. ID No. 3430, Seq. ID No. 3438, Seq. ID No. 3440, Seq. ID No. 3444, Seq. ID No. 3460, Seq. ID No. 3462, Seq. ID No. 3466, Seq. ID No. 3470, Seq. ID No. 3472, Seq. ID No.

3474, Seq. ID No. 3476, Seq. ID No. 3478, Seq. ID No. 3484, Seq. ID No. 3488, Seq. ID  
No. 3496, Seq. ID No. 3498, Seq. ID No. 3506, Seq. ID No. 3508, Seq. ID No. 3510,  
Seq. ID No. 3512, Seq. ID No. 3516, Seq. ID No. 3522, Seq. ID No. 3524, Seq. ID No.  
3530, Seq. ID No. 3536, Seq. ID No. 3542, Seq. ID No. 3552, Seq. ID No. 3560, Seq. ID  
5 No. 3564, Seq. ID No. 3568, Seq. ID No. 3576, Seq. ID No. 3578, Seq. ID No. 3584,  
Seq. ID No. 3586, Seq. ID No. 3590, Seq. ID No. 3592, Seq. ID No. 3600, Seq. ID No.  
3602, Seq. ID No. 3608, Seq. ID No. 3610, Seq. ID No. 3612, Seq. ID No. 3616, Seq. ID  
No. 3620, Seq. ID No. 3630, Seq. ID No. 3632, Seq. ID No. 3634, Seq. ID No. 3638,  
Seq. ID No. 3642, Seq. ID No. 3644, Seq. ID No. 3646, Seq. ID No. 3652, Seq. ID No.  
10 3654, Seq. ID No. 3656, Seq. ID No. 3662, Seq. ID No. 3666, Seq. ID No. 3668, Seq. ID  
No. 3670, Seq. ID No. 3676, Seq. ID No. 3682, Seq. ID No. 3690, Seq. ID No. 3696,  
Seq. ID No. 3698, Seq. ID No. 3706, Seq. ID No. 3712, Seq. ID No. 3720, Seq. ID No.  
3726, Seq. ID No. 3730, Seq. ID No. 3732, Seq. ID No. 3736, Seq. ID No. 3740, Seq. ID  
No. 3742, Seq. ID No. 3744, Seq. ID No. 3750, Seq. ID No. 3760, Seq. ID No. 3770,  
15 Seq. ID No. 3774, Seq. ID No. 3778, Seq. ID No. 3782, Seq. ID No. 3788, Seq. ID No.  
3796, Seq. ID No. 3802, Seq. ID No. 3806, Seq. ID No. 3810, Seq. ID No. 3814, Seq. ID  
No. 3820, Seq. ID No. 3822, Seq. ID No. 3826, Seq. ID No. 3828, Seq. ID No. 3830,  
Seq. ID No. 3832, Seq. ID No. 3836, Seq. ID No. 3842, Seq. ID No. 3846, Seq. ID No.  
3856, Seq. ID No. 3858, Seq. ID No. 3864, Seq. ID No. 3868, Seq. ID No. 3870, Seq. ID  
20 No. 3876, Seq. ID No. 3882, Seq. ID No. 3884, Seq. ID No. 3886, Seq. ID No. 3888,  
Seq. ID No. 3898, Seq. ID No. 3902, Seq. ID No. 3906, Seq. ID No. 3910, Seq. ID No.  
3914, Seq. ID No. 3916, Seq. ID No. 3918, Seq. ID No. 3920, Seq. ID No. 3922, Seq. ID  
No. 3930, Seq. ID No. 3932, Seq. ID No. 3936, Seq. ID No. 3942, Seq. ID No. 3944,  
Seq. ID No. 3946, Seq. ID No. 3948, Seq. ID No. 3952, Seq. ID No. 3954, Seq. ID No.  
25 3958, Seq. ID No. 3972, Seq. ID No. 3978, Seq. ID No. 3982, Seq. ID No. 3986, Seq. ID  
No. 3988, Seq. ID No. 3990, Seq. ID No. 3994, Seq. ID No. 4002, Seq. ID No. 4006,  
Seq. ID No. 4012, Seq. ID No. 4016, Seq. ID No. 4018, Seq. ID No. 4020, Seq. ID No.  
4024, Seq. ID No. 4030, Seq. ID No. 4032, Seq. ID No. 4034, Seq. ID No. 4038, Seq. ID  
No. 4040, Seq. ID No. 4050, Seq. ID No. 4052, Seq. ID No. 4058, Seq. ID No. 4060,  
30 Seq. ID No. 4066, Seq. ID No. 4070, Seq. ID No. 4076, Seq. ID No. 4080, Seq. ID No.  
4086, Seq. ID No. 4090, Seq. ID No. 4096, Seq. ID No. 4098, Seq. ID No. 4100, Seq. ID  
No. 4106, Seq. ID No. 4112, Seq. ID No. 4116, Seq. ID No. 4122, Seq. ID No. 4124,  
Seq. ID No. 4128, Seq. ID No. 4130, Seq. ID No. 4132, Seq. ID No. 4138, Seq. ID No.



4142, Seq. ID No. 4148, Seq. ID No. 4158, Seq. ID No. 4160, Seq. ID No. 4164, Seq. ID  
No. 4166, Seq. ID No. 4170, Seq. ID No. 4180, Seq. ID No. 4184, Seq. ID No. 4188,  
Seq. ID No. 4194, Seq. ID No. 4196, Seq. ID No. 4198, Seq. ID No. 4200, Seq. ID No.  
4202, Seq. ID No. 4206, Seq. ID No. 4208, Seq. ID No. 4214, Seq. ID No. 4220, Seq. ID  
5 No. 4236, Seq. ID No. 4238, Seq. ID No. 4240, Seq. ID No. 4244, Seq. ID No. 4246,  
Seq. ID No. 4256, Seq. ID No. 4260, Seq. ID No. 4268, Seq. ID No. 4272, Seq. ID No.  
4278, Seq. ID No. 4280, Seq. ID No. 4282, Seq. ID No. 4284, Seq. ID No. 4290, Seq. ID  
No. 4294, Seq. ID No. 4300, Seq. ID No. 4302, Seq. ID No. 4304, Seq. ID No. 4306,  
Seq. ID No. 4308, Seq. ID No. 4310, Seq. ID No. 4314, Seq. ID No. 4316, Seq. ID No.  
10 4324, Seq. ID No. 4326, Seq. ID No. 4328, Seq. ID No. 4332, Seq. ID No. 4334, Seq. ID  
No. 4338, Seq. ID No. 4342, Seq. ID No. 4346, Seq. ID No. 4350, Seq. ID No. 4356,  
Seq. ID No. 4358, Seq. ID No. 4366, Seq. ID No. 4368, Seq. ID No. 4372, Seq. ID No.  
4376, Seq. ID No. 4378, Seq. ID No. 4380, Seq. ID No. 4384, Seq. ID No. 4388, Seq. ID  
No. 4394, Seq. ID No. 4398, Seq. ID No. 4402, Seq. ID No. 4410, Seq. ID No. 4414,  
15 Seq. ID No. 4422, Seq. ID No. 4434, Seq. ID No. 4436, Seq. ID No. 4446, Seq. ID No.  
4450, Seq. ID No. 4458, Seq. ID No. 4462, Seq. ID No. 4464, Seq. ID No. 4472, Seq. ID  
No. 4476, Seq. ID No. 4478, Seq. ID No. 4482, Seq. ID No. 4488, Seq. ID No. 4492,  
Seq. ID No. 4500, Seq. ID No. 4502, Seq. ID No. 4504, Seq. ID No. 4510, Seq. ID No.  
4518, Seq. ID No. 4532, Seq. ID No. 4534, Seq. ID No. 4536, Seq. ID No. 4540, Seq. ID  
20 No. 4542, Seq. ID No. 4546, Seq. ID No. 4550, Seq. ID No. 4558, Seq. ID No. 4564,  
Seq. ID No. 4568, Seq. ID No. 4570, Seq. ID No. 4576, Seq. ID No. 4578, Seq. ID No.  
4580, Seq. ID No. 4584, Seq. ID No. 4592, Seq. ID No. 4594, Seq. ID No. 4598, Seq. ID  
No. 4602, Seq. ID No. 4606, Seq. ID No. 4610, Seq. ID No. 4612, Seq. ID No. 4614,  
Seq. ID No. 4624, Seq. ID No. 4626, Seq. ID No. 4630, Seq. ID No. 4634, Seq. ID No.  
25 4638, Seq. ID No. 4642, Seq. ID No. 4646, Seq. ID No. 4652, Seq. ID No. 4654, Seq. ID  
No. 4656, Seq. ID No. 4662, Seq. ID No. 4664, Seq. ID No. 4670, Seq. ID No. 4672,  
Seq. ID No. 4674, Seq. ID No. 4676, Seq. ID No. 4686, Seq. ID No. 4690, Seq. ID No.  
4698, Seq. ID No. 4704, Seq. ID No. 4706, Seq. ID No. 4714, Seq. ID No. 4718, Seq. ID  
No. 4720, Seq. ID No. 4724, Seq. ID No. 4730, Seq. ID No. 4732, Seq. ID No. 4734,  
30 Seq. ID No. 4740, Seq. ID No. 4744, Seq. ID No. 4746, Seq. ID No. 4748, Seq. ID No.  
4750, Seq. ID No. 4752, Seq. ID No. 4754, Seq. ID No. 4762, Seq. ID No. 4768, Seq. ID  
No. 4772, Seq. ID No. 4780, Seq. ID No. 4782, Seq. ID No. 4784, Seq. ID No. 4786,  
Seq. ID No. 4790, Seq. ID No. 4792, Seq. ID No. 4794, Seq. ID No. 4800, Seq. ID No.

4808, Seq. ID No. 4810, Seq. ID No. 4812, Seq. ID No. 4814, Seq. ID No. 4816, Seq. ID  
No. 4822, Seq. ID No. 4826, Seq. ID No. 4828, Seq. ID No. 4830, Seq. ID No. 4838,  
Seq. ID No. 4840, Seq. ID No. 4846, Seq. ID No. 4848, Seq. ID No. 4850, Seq. ID No.  
4858, Seq. ID No. 4862, Seq. ID No. 4866, Seq. ID No. 4868, Seq. ID No. 4876, Seq. ID  
5 No. 4880, Seq. ID No. 4882, Seq. ID No. 4884, Seq. ID No. 4886, Seq. ID No. 4888,  
Seq. ID No. 4894, Seq. ID No. 4900, Seq. ID No. 4902, Seq. ID No. 4904, Seq. ID No.  
4906, Seq. ID No. 4908, Seq. ID No. 4910, Seq. ID No. 4916, Seq. ID No. 4918, Seq. ID  
No. 4920, Seq. ID No. 4922, Seq. ID No. 4926, Seq. ID No. 4930, Seq. ID No. 4934,  
Seq. ID No. 4938, Seq. ID No. 4942, Seq. ID No. 4944, Seq. ID No. 4946, Seq. ID No.  
10 4948, Seq. ID No. 4954, Seq. ID No. 4956, Seq. ID No. 4960, Seq. ID No. 4962, Seq. ID  
No. 4966, Seq. ID No. 4968, Seq. ID No. 4972, Seq. ID No. 4974, Seq. ID No. 4978,  
Seq. ID No. 4986, Seq. ID No. 4990, Seq. ID No. 4992, Seq. ID No. 4996, Seq. ID No.  
4998, Seq. ID No. 5006, Seq. ID No. 5010, Seq. ID No. 5016, Seq. ID No. 5020, Seq. ID  
No. 5026, Seq. ID No. 5030, Seq. ID No. 5038, Seq. ID No. 5046, Seq. ID No. 5050,  
15 Seq. ID No. 5054, Seq. ID No. 5056, Seq. ID No. 5060, Seq. ID No. 5062, Seq. ID No.  
5066, Seq. ID No. 5072, Seq. ID No. 5074, Seq. ID No. 5080, Seq. ID No. 5082, Seq. ID  
No. 5084, Seq. ID No. 5088, Seq. ID No. 5090, Seq. ID No. 5094, Seq. ID No. 5096,  
Seq. ID No. 5104, Seq. ID No. 5106, Seq. ID No. 5108, Seq. ID No. 5112, Seq. ID No.  
5114, Seq. ID No. 5116, Seq. ID No. 5118, Seq. ID No. 5120, Seq. ID No. 5142, Seq. ID  
20 No. 5144, Seq. ID No. 5148, Seq. ID No. 5154, Seq. ID No. 5156, Seq. ID No. 5164,  
Seq. ID No. 5170, Seq. ID No. 5172, Seq. ID No. 5174, Seq. ID No. 5180, Seq. ID No.  
5186, Seq. ID No. 5188, Seq. ID No. 5194, Seq. ID No. 5196, Seq. ID No. 5202, Seq. ID  
No. 5204, Seq. ID No. 5206, Seq. ID No. 5210, Seq. ID No. 5212, Seq. ID No. 5214,  
Seq. ID No. 5218, Seq. ID No. 5226, Seq. ID No. 5232, Seq. ID No. 5234, Seq. ID No.  
25 5238, Seq. ID No. 5240, Seq. ID No. 5246, Seq. ID No. 5248, Seq. ID No. 5250, Seq. ID  
No. 5256, Seq. ID No. 5258, Seq. ID No. 5260, Seq. ID No. 5264, Seq. ID No. 5270,  
Seq. ID No. 5274, Seq. ID No. 5284, Seq. ID No. 5290, Seq. ID No. 5294, Seq. ID No.  
5308, Seq. ID No. 5312, Seq. ID No. 5314, Seq. ID No. 5316, Seq. ID No. 5324, Seq. ID  
No. 5326, Seq. ID No. 5336, Seq. ID No. 5338, Seq. ID No. 5340, Seq. ID No. 5346,  
30 Seq. ID No. 5348, Seq. ID No. 5350, Seq. ID No. 5354, Seq. ID No. 5362, Seq. ID No.  
5366, Seq. ID No. 5368, Seq. ID No. 5370, Seq. ID No. 5374, Seq. ID No. 5376, Seq. ID  
No. 5388, Seq. ID No. 5390, Seq. ID No. 5392, Seq. ID No. 5394, Seq. ID No. 5396,  
Seq. ID No. 5398, Seq. ID No. 5400, Seq. ID No. 5402, Seq. ID No. 5404, Seq. ID No.

5406, Seq. ID No. 5412, Seq. ID No. 5416, Seq. ID No. 5418, Seq. ID No. 5420, Seq. ID  
No. 5422, Seq. ID No. 5424, Seq. ID No. 5430, Seq. ID No. 5434, Seq. ID No. 5442,  
Seq. ID No. 5444, Seq. ID No. 5446, Seq. ID No. 5450, Seq. ID No. 5452, Seq. ID No.  
5454, Seq. ID No. 5456, Seq. ID No. 5458, Seq. ID No. 5470, Seq. ID No. 5476, Seq. ID  
5 No. 5484, Seq. ID No. 5486, Seq. ID No. 5490, Seq. ID No. 5494, Seq. ID No. 5500,  
Seq. ID No. 5502, Seq. ID No. 5506, Seq. ID No. 5510, Seq. ID No. 5512, Seq. ID No.  
5524, Seq. ID No. 5530, Seq. ID No. 5536, Seq. ID No. 5540, Seq. ID No. 5542, Seq. ID  
No. 5548, Seq. ID No. 5552, Seq. ID No. 5556, Seq. ID No. 5560, Seq. ID No. 5562,  
Seq. ID No. 5566, Seq. ID No. 5572, Seq. ID No. 5574, Seq. ID No. 5580, Seq. ID No.  
10 5584, Seq. ID No. 5590, Seq. ID No. 5600, Seq. ID No. 5602, Seq. ID No. 5604, Seq. ID  
No. 5614, Seq. ID No. 5622, Seq. ID No. 5628, Seq. ID No. 5632, Seq. ID No. 5636,  
Seq. ID No. 5646, Seq. ID No. 5652, Seq. ID No. 5654, Seq. ID No. 5658, Seq. ID No.  
5662, Seq. ID No. 5664, Seq. ID No. 5666, Seq. ID No. 5670, Seq. ID No. 5672, Seq. ID  
No. 5674, Seq. ID No. 5676, Seq. ID No. 5682, Seq. ID No. 5694, Seq. ID No. 5696,  
15 Seq. ID No. 5700, Seq. ID No. 5702, Seq. ID No. 5708, Seq. ID No. 5714, Seq. ID No.  
5718, Seq. ID No. 5724, Seq. ID No. 5726, Seq. ID No. 5732, Seq. ID No. 5738, Seq. ID  
No. 5748, Seq. ID No. 5752, Seq. ID No. 5756, Seq. ID No. 5760, Seq. ID No. 5772,  
Seq. ID No. 5774, Seq. ID No. 5778, Seq. ID No. 5780, Seq. ID No. 5782, Seq. ID No.  
5786, Seq. ID No. 5794, Seq. ID No. 5800, Seq. ID No. 5806, Seq. ID No. 5812, Seq. ID  
20 No. 5816, Seq. ID No. 5818, Seq. ID No. 5824, Seq. ID No. 5832, Seq. ID No. 5836,  
Seq. ID No. 5840, Seq. ID No. 5844, Seq. ID No. 5848, Seq. ID No. 5850, Seq. ID No.  
5852, Seq. ID No. 5854, Seq. ID No. 5856, Seq. ID No. 5858, Seq. ID No. 5862, Seq. ID  
No. 5868, Seq. ID No. 5876, Seq. ID No. 5878, Seq. ID No. 5882, Seq. ID No. 5890,  
Seq. ID No. 5896, Seq. ID No. 5898, Seq. ID No. 5902, Seq. ID No. 5904, Seq. ID No.  
25 5908, Seq. ID No. 5914, Seq. ID No. 5916, Seq. ID No. 5918, Seq. ID No. 5920, Seq. ID  
No. 5926, Seq. ID No. 5932, Seq. ID No. 5934, Seq. ID No. 5936, Seq. ID No. 5942,  
Seq. ID No. 5944, Seq. ID No. 5946, Seq. ID No. 5950, Seq. ID No. 5956, Seq. ID No.  
5958, Seq. ID No. 5960, Seq. ID No. 5968, Seq. ID No. 5972, Seq. ID No. 5976, Seq. ID  
No. 5978, Seq. ID No. 5982, Seq. ID No. 5984, Seq. ID No. 5986, Seq. ID No. 5990,  
30 Seq. ID No. 5992, Seq. ID No. 5996, Seq. ID No. 5998, Seq. ID No. 6004, Seq. ID No.  
6006, Seq. ID No. 6008, Seq. ID No. 6016, Seq. ID No. 6018, Seq. ID No. 6020, Seq. ID  
No. 6024, Seq. ID No. 6030, Seq. ID No. 6034, Seq. ID No. 6036, Seq. ID No. 6038,  
Seq. ID No. 6044, Seq. ID No. 6050, Seq. ID No. 6056, Seq. ID No. 6066, Seq. ID No.

6070, Seq. ID No. 6076, Seq. ID No. 6082, Seq. ID No. 6084, Seq. ID No. 6088, Seq. ID No. 6096, Seq. ID No. 6098, Seq. ID No. 6100, Seq. ID No. 6104, Seq. ID No. 6106, Seq. ID No. 6114, Seq. ID No. 6116, Seq. ID No. 6120, Seq. ID No. 6126, Seq. ID No. 6128, Seq. ID No. 6130, Seq. ID No. 6132, Seq. ID No. 6134, Seq. ID No. 6142, Seq. ID No. 6144, Seq. ID No. 6148, Seq. ID No. 6154, Seq. ID No. 6166, Seq. ID No. 6170, Seq. ID No. 6172, Seq. ID No. 6174, Seq. ID No. 6178, Seq. ID No. 6180, Seq. ID No. 6188, Seq. ID No. 6194, Seq. ID No. 6202, Seq. ID No. 6208, Seq. ID No. 6212, Seq. ID No. 6216, Seq. ID No. 6220, Seq. ID No. 6232, Seq. ID No. 6236, Seq. ID No. 6244, Seq. ID No. 6248, Seq. ID No. 6252, Seq. ID No. 6256, Seq. ID No. 6262, Seq. ID No. 6264, Seq. ID No. 6270, Seq. ID No. 6276, Seq. ID No. 6278, Seq. ID No. 6280, Seq. ID No. 6288, Seq. ID No. 6292, Seq. ID No. 6300, Seq. ID No. 6306, Seq. ID No. 6308, Seq. ID No. 6314, Seq. ID No. 6316, Seq. ID No. 6322, Seq. ID No. 6324, Seq. ID No. 6326, Seq. ID No. 6332, Seq. ID No. 6336, Seq. ID No. 6340, Seq. ID No. 6342, Seq. ID No. 6344, Seq. ID No. 6346, Seq. ID No. 6348, Seq. ID No. 6356, Seq. ID No. 6360, Seq. ID No. 6362, Seq. ID No. 6366, Seq. ID No. 6370, Seq. ID No. 6372, Seq. ID No. 6376, Seq. ID No. 6378, Seq. ID No. 6380, Seq. ID No. 6388, Seq. ID No. 6392, Seq. ID No. 6398, Seq. ID No. 6402, Seq. ID No. 6406, Seq. ID No. 6410, Seq. ID No. 6414, Seq. ID No. 6418, Seq. ID No. 6420, Seq. ID No. 6424, Seq. ID No. 6430, Seq. ID No. 6434, Seq. ID No. 6436, Seq. ID No. 6440, Seq. ID No. 6446, Seq. ID No. 6448, Seq. ID No. 6452, Seq. ID No. 6456, Seq. ID No. 6460, Seq. ID No. 6462, Seq. ID No. 6464, Seq. ID No. 6476, Seq. ID No. 6482, Seq. ID No. 6484, Seq. ID No. 6486, Seq. ID No. 6488, Seq. ID No. 6490, Seq. ID No. 6492, Seq. ID No. 6494, Seq. ID No. 6496, Seq. ID No. 6500, Seq. ID No. 6506, Seq. ID No. 6510, Seq. ID No. 6514, Seq. ID No. 6520, Seq. ID No. 6522, Seq. ID No. 6526, Seq. ID No. 6528, Seq. ID No. 6532, Seq. ID No. 6534, Seq. ID No. 6536, Seq. ID No. 6546, Seq. ID No. 6552, Seq. ID No. 6554, Seq. ID No. 6560, Seq. ID No. 6562, Seq. ID No. 6564, Seq. ID No. 6566, Seq. ID No. 6568, Seq. ID No. 6570, Seq. ID No. 6576, Seq. ID No. 6580, Seq. ID No. 6584, Seq. ID No. 6586, Seq. ID No. 6592, Seq. ID No. 6596, Seq. ID No. 6606, Seq. ID No. 6608, Seq. ID No. 6612, Seq. ID No. 6616, Seq. ID No. 6618, Seq. ID No. 6620, Seq. ID No. 6624, Seq. ID No. 6626, Seq. ID No. 6630, Seq. ID No. 6634, Seq. ID No. 6636, Seq. ID No. 6642, and Seq. ID No. 6648.

In yet another preferred embodiment, the polypeptide is selected from the *Alloiococcus otitidis* polypeptides identified by the Applicants' assignee's ORF finder

program that searches for an ATG, GTG or TTG Start codon between a Stop-Stop region, and wherein the polypeptide is selected from one Seq. ID No. 2, Seq. ID No. 6, Seq. ID No. 12, Seq. ID No. 14, Seq. ID No. 16, Seq. ID No. 18, Seq. ID No. 20, Seq. ID No. 22, Seq. ID No. 24, Seq. ID No. 28, Seq. ID No. 30, Seq. ID No. 32, Seq. ID No. 36, Seq. ID No. 38, Seq. ID No. 42, Seq. ID No. 44, Seq. ID No. 46, Seq. ID No. 48, Seq. ID No. 50, Seq. ID No. 52, Seq. ID No. 54, Seq. ID No. 56, Seq. ID No. 58, Seq. ID No. 60, Seq. ID No. 66, Seq. ID No. 68, Seq. ID No. 76, Seq. ID No. 78, Seq. ID No. 80, Seq. ID No. 82, Seq. ID No. 84, Seq. ID No. 90, Seq. ID No. 92, Seq. ID No. 94, Seq. ID No. 98, Seq. ID No. 100, Seq. ID No. 104, Seq. ID No. 106, Seq. ID No. 108, Seq. ID No. 110, Seq. ID No. 112, Seq. ID No. 114, Seq. ID No. 116, Seq. ID No. 118, Seq. ID No. 120, Seq. ID No. 122, Seq. ID No. 128, Seq. ID No. 130, Seq. ID No. 132, Seq. ID No. 134, Seq. ID No. 136, Seq. ID No. 138, Seq. ID No. 140, Seq. ID No. 144, Seq. ID No. 146, Seq. ID No. 148, Seq. ID No. 150, Seq. ID No. 154, Seq. ID No. 156, Seq. ID No. 158, Seq. ID No. 160, Seq. ID No. 162, Seq. ID No. 164, Seq. ID No. 166, Seq. ID No. 168, Seq. ID No. 170, Seq. ID No. 172, Seq. ID No. 176, Seq. ID No. 178, Seq. ID No. 180, Seq. ID No. 182, Seq. ID No. 184, Seq. ID No. 188, Seq. ID No. 192, Seq. ID No. 194, Seq. ID No. 196, Seq. ID No. 202, Seq. ID No. 206, Seq. ID No. 208, Seq. ID No. 216, Seq. ID No. 220, Seq. ID No. 222, Seq. ID No. 224, Seq. ID No. 226, Seq. ID No. 228, Seq. ID No. 232, Seq. ID No. 234, Seq. ID No. 240, Seq. ID No. 244, Seq. ID No. 246, Seq. ID No. 248, Seq. ID No. 254, Seq. ID No. 258, Seq. ID No. 260, Seq. ID No. 262, Seq. ID No. 264, Seq. ID No. 266, Seq. ID No. 268, Seq. ID No. 270, Seq. ID No. 274, Seq. ID No. 278, Seq. ID No. 280, Seq. ID No. 282, Seq. ID No. 284, Seq. ID No. 292, Seq. ID No. 294, Seq. ID No. 298, Seq. ID No. 302, Seq. ID No. 306, Seq. ID No. 308, Seq. ID No. 310, Seq. ID No. 314, Seq. ID No. 318, Seq. ID No. 322, Seq. ID No. 324, Seq. ID No. 326, Seq. ID No. 332, Seq. ID No. 334, Seq. ID No. 336, Seq. ID No. 338, Seq. ID No. 340, Seq. ID No. 344, Seq. ID No. 346, Seq. ID No. 348, Seq. ID No. 350, Seq. ID No. 354, Seq. ID No. 356, Seq. ID No. 358, Seq. ID No. 360, Seq. ID No. 362, Seq. ID No. 364, Seq. ID No. 366, Seq. ID No. 368, Seq. ID No. 370, Seq. ID No. 372, Seq. ID No. 376, Seq. ID No. 378, Seq. ID No. 380, Seq. ID No. 384, Seq. ID No. 386, Seq. ID No. 388, Seq. ID No. 390, Seq. ID No. 392, Seq. ID No. 394, Seq. ID No. 398, Seq. ID No. 402, Seq. ID No. 404, Seq. ID No. 406, Seq. ID No. 408, Seq. ID No. 410, Seq. ID No. 416, Seq. ID No. 424, Seq. ID No. 426, Seq. ID No. 428, Seq. ID No. 430, Seq. ID No. 432, Seq. ID No. 434, Seq. ID No. 436, Seq. ID No. 438, Seq. ID No. 440,

Seq. ID No. 442, Seq. ID No. 444, Seq. ID No. 446, Seq. ID No. 448, Seq. ID No. 452,  
Seq. ID No. 454, Seq. ID No. 456, Seq. ID No. 458, Seq. ID No. 462, Seq. ID No. 464,  
Seq. ID No. 468, Seq. ID No. 470, Seq. ID No. 472, Seq. ID No. 474, Seq. ID No. 476,  
Seq. ID No. 478, Seq. ID No. 480, Seq. ID No. 482, Seq. ID No. 484, Seq. ID No. 486,  
5 Seq. ID No. 490, Seq. ID No. 492, Seq. ID No. 494, Seq. ID No. 496, Seq. ID No. 502,  
Seq. ID No. 506, Seq. ID No. 508, Seq. ID No. 512, Seq. ID No. 516, Seq. ID No. 518,  
Seq. ID No. 524, Seq. ID No. 530, Seq. ID No. 532, Seq. ID No. 534, Seq. ID No. 538,  
Seq. ID No. 540, Seq. ID No. 544, Seq. ID No. 548, Seq. ID No. 550, Seq. ID No. 552,  
Seq. ID No. 554, Seq. ID No. 556, Seq. ID No. 558, Seq. ID No. 560, Seq. ID No. 562,  
10 Seq. ID No. 566, Seq. ID No. 570, Seq. ID No. 572, Seq. ID No. 574, Seq. ID No. 576,  
Seq. ID No. 580, Seq. ID No. 582, Seq. ID No. 586, Seq. ID No. 588, Seq. ID No. 590,  
Seq. ID No. 592, Seq. ID No. 594, Seq. ID No. 596, Seq. ID No. 598, Seq. ID No. 600,  
Seq. ID No. 602, Seq. ID No. 604, Seq. ID No. 606, Seq. ID No. 610, Seq. ID No. 614,  
Seq. ID No. 616, Seq. ID No. 618, Seq. ID No. 620, Seq. ID No. 622, Seq. ID No. 624,  
15 Seq. ID No. 626, Seq. ID No. 628, Seq. ID No. 636, Seq. ID No. 638, Seq. ID No. 644,  
Seq. ID No. 646, Seq. ID No. 648, Seq. ID No. 650, Seq. ID No. 656, Seq. ID No. 664,  
Seq. ID No. 666, Seq. ID No. 668, Seq. ID No. 670, Seq. ID No. 676, Seq. ID No. 682,  
Seq. ID No. 684, Seq. ID No. 688, Seq. ID No. 690, Seq. ID No. 692, Seq. ID No. 696,  
Seq. ID No. 698, Seq. ID No. 700, Seq. ID No. 702, Seq. ID No. 704, Seq. ID No. 706,  
20 Seq. ID No. 708, Seq. ID No. 710, Seq. ID No. 714, Seq. ID No. 726, Seq. ID No. 728,  
Seq. ID No. 730, Seq. ID No. 732, Seq. ID No. 734, Seq. ID No. 736, Seq. ID No. 740,  
Seq. ID No. 742, Seq. ID No. 746, Seq. ID No. 748, Seq. ID No. 750, Seq. ID No. 752,  
Seq. ID No. 754, Seq. ID No. 760, Seq. ID No. 764, Seq. ID No. 766, Seq. ID No. 774,  
Seq. ID No. 776, Seq. ID No. 782, Seq. ID No. 784, Seq. ID No. 788, Seq. ID No. 794,  
25 Seq. ID No. 796, Seq. ID No. 800, Seq. ID No. 802, Seq. ID No. 806, Seq. ID No. 808,  
Seq. ID No. 810, Seq. ID No. 812, Seq. ID No. 814, Seq. ID No. 816, Seq. ID No. 818,  
Seq. ID No. 820, Seq. ID No. 822, Seq. ID No. 824, Seq. ID No. 828, Seq. ID No. 830,  
Seq. ID No. 832, Seq. ID No. 836, Seq. ID No. 838, Seq. ID No. 840, Seq. ID No. 844,  
Seq. ID No. 846, Seq. ID No. 848, Seq. ID No. 856, Seq. ID No. 860, Seq. ID No. 862,  
30 Seq. ID No. 866, Seq. ID No. 868, Seq. ID No. 872, Seq. ID No. 874, Seq. ID No. 876,  
Seq. ID No. 878, Seq. ID No. 880, Seq. ID No. 882, Seq. ID No. 886, Seq. ID No. 896,  
Seq. ID No. 898, Seq. ID No. 900, Seq. ID No. 902, Seq. ID No. 904, Seq. ID No. 906,  
Seq. ID No. 908, Seq. ID No. 910, Seq. ID No. 914, Seq. ID No. 916, Seq. ID No. 922,

Seq. ID No. 924, Seq. ID No. 926, Seq. ID No. 932, Seq. ID No. 934, Seq. ID No. 936,  
Seq. ID No. 938, Seq. ID No. 940, Seq. ID No. 942, Seq. ID No. 944, Seq. ID No. 948,  
Seq. ID No. 950, Seq. ID No. 952, Seq. ID No. 954, Seq. ID No. 956, Seq. ID No. 958,  
Seq. ID No. 962, Seq. ID No. 964, Seq. ID No. 966, Seq. ID No. 968, Seq. ID No. 970,  
5 Seq. ID No. 972, Seq. ID No. 974, Seq. ID No. 976, Seq. ID No. 982, Seq. ID No. 984,  
Seq. ID No. 986, Seq. ID No. 988, Seq. ID No. 990, Seq. ID No. 992, Seq. ID No. 994,  
Seq. ID No. 996, Seq. ID No. 998, Seq. ID No. 1002, Seq. ID No. 1004, Seq. ID No.  
1006, Seq. ID No. 1008, Seq. ID No. 1010, Seq. ID No. 1018, Seq. ID No. 1020, Seq. ID  
No. 1024, Seq. ID No. 1026, Seq. ID No. 1028, Seq. ID No. 1040, Seq. ID No. 1042,  
10 Seq. ID No. 1044, Seq. ID No. 1046, Seq. ID No. 1048, Seq. ID No. 1050, Seq. ID No.  
1052, Seq. ID No. 1058, Seq. ID No. 1060, Seq. ID No. 1062, Seq. ID No. 1066, Seq. ID  
No. 1070, Seq. ID No. 1076, Seq. ID No. 1078, Seq. ID No. 1080, Seq. ID No. 1082,  
Seq. ID No. 1084, Seq. ID No. 1086, Seq. ID No. 1088, Seq. ID No. 1092, Seq. ID No.  
1094, Seq. ID No. 1096, Seq. ID No. 1098, Seq. ID No. 1100, Seq. ID No. 1102, Seq. ID  
15 No. 1104, Seq. ID No. 1108, Seq. ID No. 1110, Seq. ID No. 1112, Seq. ID No. 1114,  
Seq. ID No. 1116, Seq. ID No. 1120, Seq. ID No. 1122, Seq. ID No. 1124, Seq. ID No.  
1126, Seq. ID No. 1128, Seq. ID No. 1130, Seq. ID No. 1132, Seq. ID No. 1138, Seq. ID  
No. 1140, Seq. ID No. 1142, Seq. ID No. 1144, Seq. ID No. 1146, Seq. ID No. 1148,  
Seq. ID No. 1150, Seq. ID No. 1152, Seq. ID No. 1154, Seq. ID No. 1156, Seq. ID No.  
20 1158, Seq. ID No. 1160, Seq. ID No. 1162, Seq. ID No. 1164, Seq. ID No. 1172, Seq. ID  
No. 1176, Seq. ID No. 1178, Seq. ID No. 1180, Seq. ID No. 1182, Seq. ID No. 1188,  
Seq. ID No. 1192, Seq. ID No. 1194, Seq. ID No. 1196, Seq. ID No. 1198, Seq. ID No.  
1202, Seq. ID No. 1204, Seq. ID No. 1206, Seq. ID No. 1208, Seq. ID No. 1212, Seq. ID  
No. 1214, Seq. ID No. 1216, Seq. ID No. 1218, Seq. ID No. 1222, Seq. ID No. 1224,  
25 Seq. ID No. 1226, Seq. ID No. 1232, Seq. ID No. 1234, Seq. ID No. 1238, Seq. ID No.  
1240, Seq. ID No. 1242, Seq. ID No. 1246, Seq. ID No. 1248, Seq. ID No. 1250, Seq. ID  
No. 1252, Seq. ID No. 1254, Seq. ID No. 1256, Seq. ID No. 1258, Seq. ID No. 1260,  
Seq. ID No. 1262, Seq. ID No. 1264, Seq. ID No. 1272, Seq. ID No. 1274, Seq. ID No.  
1276, Seq. ID No. 1278, Seq. ID No. 1280, Seq. ID No. 1286, Seq. ID No. 1290, Seq. ID  
30 No. 1292, Seq. ID No. 1294, Seq. ID No. 1296, Seq. ID No. 1298, Seq. ID No. 1300,  
Seq. ID No. 1302, Seq. ID No. 1304, Seq. ID No. 1306, Seq. ID No. 1308, Seq. ID No.  
1310, Seq. ID No. 1312, Seq. ID No. 1314, Seq. ID No. 1318, Seq. ID No. 1320, Seq. ID  
No. 1322, Seq. ID No. 1332, Seq. ID No. 1334, Seq. ID No. 1336, Seq. ID No. 1338,

Seq. ID No. 1340, Seq. ID No. 1344, Seq. ID No. 1346, Seq. ID No. 1348, Seq. ID No. 1350, Seq. ID No. 1352, Seq. ID No. 1360, Seq. ID No. 1362, Seq. ID No. 1364, Seq. ID No. 1366, Seq. ID No. 1370, Seq. ID No. 1372, Seq. ID No. 1376, Seq. ID No. 1378, Seq. ID No. 1382, Seq. ID No. 1384, Seq. ID No. 1386, Seq. ID No. 1388, Seq. ID No. 1390, Seq. ID No. 1392, Seq. ID No. 1394, Seq. ID No. 1402, Seq. ID No. 1404, Seq. ID No. 1408, Seq. ID No. 1410, Seq. ID No. 1412, Seq. ID No. 1414, Seq. ID No. 1416, Seq. ID No. 1420, Seq. ID No. 1422, Seq. ID No. 1424, Seq. ID No. 1426, Seq. ID No. 1428, Seq. ID No. 1430, Seq. ID No. 1434, Seq. ID No. 1438, Seq. ID No. 1442, Seq. ID No. 1444, Seq. ID No. 1448, Seq. ID No. 1450, Seq. ID No. 1452, Seq. ID No. 1456, Seq. ID No. 1460, Seq. ID No. 1464, Seq. ID No. 1466, Seq. ID No. 1468, Seq. ID No. 1470, Seq. ID No. 1472, Seq. ID No. 1474, Seq. ID No. 1476, Seq. ID No. 1478, Seq. ID No. 1480, Seq. ID No. 1484, Seq. ID No. 1486, Seq. ID No. 1488, Seq. ID No. 1492, Seq. ID No. 1494, Seq. ID No. 1496, Seq. ID No. 1498, Seq. ID No. 1500, Seq. ID No. 1502, Seq. ID No. 1506, Seq. ID No. 1508, Seq. ID No. 1512, Seq. ID No. 1518, Seq. ID No. 1520, Seq. ID No. 1524, Seq. ID No. 1526, Seq. ID No. 1528, Seq. ID No. 1532, Seq. ID No. 1540, Seq. ID No. 1544, Seq. ID No. 1550, Seq. ID No. 1552, Seq. ID No. 1554, Seq. ID No. 1556, Seq. ID No. 1558, Seq. ID No. 1562, Seq. ID No. 1564, Seq. ID No. 1566, Seq. ID No. 1568, Seq. ID No. 1572, Seq. ID No. 1574, Seq. ID No. 1576, Seq. ID No. 1578, Seq. ID No. 1580, Seq. ID No. 1582, Seq. ID No. 1590, Seq. ID No. 1594, Seq. ID No. 1596, Seq. ID No. 1598, Seq. ID No. 1600, Seq. ID No. 1602, Seq. ID No. 1608, Seq. ID No. 1612, Seq. ID No. 1614, Seq. ID No. 1616, Seq. ID No. 1618, Seq. ID No. 1620, Seq. ID No. 1624, Seq. ID No. 1626, Seq. ID No. 1628, Seq. ID No. 1634, Seq. ID No. 1638, Seq. ID No. 1640, Seq. ID No. 1642, Seq. ID No. 1644, Seq. ID No. 1648, Seq. ID No. 1652, Seq. ID No. 1654, Seq. ID No. 1656, Seq. ID No. 1658, Seq. ID No. 1662, Seq. ID No. 1664, Seq. ID No. 1666, Seq. ID No. 1670, Seq. ID No. 1676, Seq. ID No. 1680, Seq. ID No. 1682, Seq. ID No. 1686, Seq. ID No. 1688, Seq. ID No. 1690, Seq. ID No. 1692, Seq. ID No. 1694, Seq. ID No. 1696, Seq. ID No. 1698, Seq. ID No. 1700, Seq. ID No. 1704, Seq. ID No. 1706, Seq. ID No. 1708, Seq. ID No. 1712, Seq. ID No. 1714, Seq. ID No. 1716, Seq. ID No. 1718, Seq. ID No. 1720, Seq. ID No. 1722, Seq. ID No. 1724, Seq. ID No. 1728, Seq. ID No. 1730, Seq. ID No. 1736, Seq. ID No. 1738, Seq. ID No. 1740, Seq. ID No. 1742, Seq. ID No. 1748, Seq. ID No. 1750, Seq. ID No. 1752, Seq. ID No. 1756, Seq. ID No. 1758, Seq. ID No. 1760, Seq. ID No. 1764, Seq. ID No. 1770, Seq. ID No. 1772, Seq. ID No. 1776, Seq. ID No. 1778,



Seq. ID No. 1780, Seq. ID No. 1782, Seq. ID No. 1784, Seq. ID No. 1786, Seq. ID No. 1790, Seq. ID No. 1792, Seq. ID No. 1794, Seq. ID No. 1796, Seq. ID No. 1798, Seq. ID No. 1806, Seq. ID No. 1810, Seq. ID No. 1812, Seq. ID No. 1814, Seq. ID No. 1816, Seq. ID No. 1818, Seq. ID No. 1820, Seq. ID No. 1822, Seq. ID No. 1824, Seq. ID No. 1826, Seq. ID No. 1830, Seq. ID No. 1834, Seq. ID No. 1842, Seq. ID No. 1844, Seq. ID No. 1846, Seq. ID No. 1848, Seq. ID No. 1850, Seq. ID No. 1854, Seq. ID No. 1856, Seq. ID No. 1858, Seq. ID No. 1860, Seq. ID No. 1862, Seq. ID No. 1864, Seq. ID No. 1866, Seq. ID No. 1868, Seq. ID No. 1872, Seq. ID No. 1874, Seq. ID No. 1876, Seq. ID No. 1878, Seq. ID No. 1882, Seq. ID No. 1884, Seq. ID No. 1886, Seq. ID No. 1888, Seq. ID No. 1890, Seq. ID No. 1896, Seq. ID No. 1904, Seq. ID No. 1906, Seq. ID No. 1908, Seq. ID No. 1912, Seq. ID No. 1914, Seq. ID No. 1916, Seq. ID No. 1920, Seq. ID No. 1924, Seq. ID No. 1926, Seq. ID No. 1928, Seq. ID No. 1930, Seq. ID No. 1932, Seq. ID No. 1936, Seq. ID No. 1942, Seq. ID No. 1944, Seq. ID No. 1946, Seq. ID No. 1948, Seq. ID No. 1950, Seq. ID No. 1952, Seq. ID No. 1954, Seq. ID No. 1960, Seq. ID No. 1962, Seq. ID No. 1964, Seq. ID No. 1966, Seq. ID No. 1968, Seq. ID No. 1970, Seq. ID No. 1972, Seq. ID No. 1980, Seq. ID No. 1984, Seq. ID No. 1986, Seq. ID No. 1988, Seq. ID No. 1990, Seq. ID No. 1992, Seq. ID No. 1996, Seq. ID No. 1998, Seq. ID No. 2000, Seq. ID No. 2002, Seq. ID No. 2004, Seq. ID No. 2006, Seq. ID No. 2008, Seq. ID No. 2016, Seq. ID No. 2020, Seq. ID No. 2022, Seq. ID No. 2026, Seq. ID No. 2028, Seq. ID No. 2030, Seq. ID No. 2032, Seq. ID No. 2036, Seq. ID No. 2038, Seq. ID No. 2042, Seq. ID No. 2044, Seq. ID No. 2046, Seq. ID No. 2048, Seq. ID No. 2054, Seq. ID No. 2056, Seq. ID No. 2060, Seq. ID No. 2064, Seq. ID No. 2066, Seq. ID No. 2068, Seq. ID No. 2070, Seq. ID No. 2072, Seq. ID No. 2074, Seq. ID No. 2076, Seq. ID No. 2078, Seq. ID No. 2080, Seq. ID No. 2082, Seq. ID No. 2084, Seq. ID No. 2086, Seq. ID No. 2090, Seq. ID No. 2092, Seq. ID No. 2094, Seq. ID No. 2098, Seq. ID No. 2100, Seq. ID No. 2102, Seq. ID No. 2104, Seq. ID No. 2108, Seq. ID No. 2110, Seq. ID No. 2112, Seq. ID No. 2116, Seq. ID No. 2118, Seq. ID No. 2120, Seq. ID No. 2126, Seq. ID No. 2128, Seq. ID No. 2130, Seq. ID No. 2132, Seq. ID No. 2134, Seq. ID No. 2136, Seq. ID No. 2138, Seq. ID No. 2142, Seq. ID No. 2144, Seq. ID No. 2146, Seq. ID No. 2150, Seq. ID No. 2152, Seq. ID No. 2154, Seq. ID No. 2156, Seq. ID No. 2158, Seq. ID No. 2160, Seq. ID No. 2162, Seq. ID No. 2166, Seq. ID No. 2168, Seq. ID No. 2170, Seq. ID No. 2180, Seq. ID No. 2182, Seq. ID No. 2184, Seq. ID No. 2190, Seq. ID No. 2192, Seq. ID No. 2196, Seq. ID No. 2198, Seq. ID No. 2200, Seq. ID No. 2202,

Seq. ID No. 2204, Seq. ID No. 2206, Seq. ID No. 2208, Seq. ID No. 2210, Seq. ID No. 2212, Seq. ID No. 2214, Seq. ID No. 2216, Seq. ID No. 2218, Seq. ID No. 2222, Seq. ID No. 2224, Seq. ID No. 2228, Seq. ID No. 2230, Seq. ID No. 2236, Seq. ID No. 2242, Seq. ID No. 2246, Seq. ID No. 2248, Seq. ID No. 2252, Seq. ID No. 2254, Seq. ID No. 2258, Seq. ID No. 2260, Seq. ID No. 2262, Seq. ID No. 2264, Seq. ID No. 2266, Seq. ID No. 2268, Seq. ID No. 2270, Seq. ID No. 2276, Seq. ID No. 2278, Seq. ID No. 2280, Seq. ID No. 2286, Seq. ID No. 2288, Seq. ID No. 2298, Seq. ID No. 2300, Seq. ID No. 2302, Seq. ID No. 2310, Seq. ID No. 2312, Seq. ID No. 2316, Seq. ID No. 2328, Seq. ID No. 2330, Seq. ID No. 2334, Seq. ID No. 2344, Seq. ID No. 2346, Seq. ID No. 2350, Seq. ID No. 2352, Seq. ID No. 2358, Seq. ID No. 2364, Seq. ID No. 2366, Seq. ID No. 2368, Seq. ID No. 2370, Seq. ID No. 2372, Seq. ID No. 2374, Seq. ID No. 2376, Seq. ID No. 2380, Seq. ID No. 2382, Seq. ID No. 2386, Seq. ID No. 2388, Seq. ID No. 2392, Seq. ID No. 2394, Seq. ID No. 2396, Seq. ID No. 2398, Seq. ID No. 2400, Seq. ID No. 2402, Seq. ID No. 2406, Seq. ID No. 2410, Seq. ID No. 2414, Seq. ID No. 2416, Seq. ID No. 2418, Seq. ID No. 2422, Seq. ID No. 2424, Seq. ID No. 2426, Seq. ID No. 2428, Seq. ID No. 2430, Seq. ID No. 2436, Seq. ID No. 2438, Seq. ID No. 2446, Seq. ID No. 2448, Seq. ID No. 2450, Seq. ID No. 2452, Seq. ID No. 2454, Seq. ID No. 2456, Seq. ID No. 2458, Seq. ID No. 2460, Seq. ID No. 2462, Seq. ID No. 2464, Seq. ID No. 2466, Seq. ID No. 2470, Seq. ID No. 2472, Seq. ID No. 2476, Seq. ID No. 2482, Seq. ID No. 2484, Seq. ID No. 2486, Seq. ID No. 2492, Seq. ID No. 2494, Seq. ID No. 2496, Seq. ID No. 2500, Seq. ID No. 2502, Seq. ID No. 2504, Seq. ID No. 2506, Seq. ID No. 2508, Seq. ID No. 2512, Seq. ID No. 2514, Seq. ID No. 2518, Seq. ID No. 2520, Seq. ID No. 2522, Seq. ID No. 2526, Seq. ID No. 2530, Seq. ID No. 2534, Seq. ID No. 2536, Seq. ID No. 2538, Seq. ID No. 2540, Seq. ID No. 2548, Seq. ID No. 2550, Seq. ID No. 2552, Seq. ID No. 2554, Seq. ID No. 2560, Seq. ID No. 2562, Seq. ID No. 2564, Seq. ID No. 2566, Seq. ID No. 2574, Seq. ID No. 2576, Seq. ID No. 2578, Seq. ID No. 2580, Seq. ID No. 2582, Seq. ID No. 2588, Seq. ID No. 2590, Seq. ID No. 2592, Seq. ID No. 2594, Seq. ID No. 2596, Seq. ID No. 2600, Seq. ID No. 2604, Seq. ID No. 2606, Seq. ID No. 2608, Seq. ID No. 2610, Seq. ID No. 2612, Seq. ID No. 2614, Seq. ID No. 2618, Seq. ID No. 2620, Seq. ID No. 2624, Seq. ID No. 2626, Seq. ID No. 2628, Seq. ID No. 2630, Seq. ID No. 2632, Seq. ID No. 2634, Seq. ID No. 2636, Seq. ID No. 2638, Seq. ID No. 2640, Seq. ID No. 2642, Seq. ID No. 2644, Seq. ID No. 2646, Seq. ID No. 2648, Seq. ID No. 2650, Seq. ID No. 2652, Seq. ID No. 2654, Seq. ID No. 2656, Seq. ID No. 2660,

Seq. ID No. 2664, Seq. ID No. 2668, Seq. ID No. 2670, Seq. ID No. 2672, Seq. ID No. 2676, Seq. ID No. 2678, Seq. ID No. 2684, Seq. ID No. 2686, Seq. ID No. 2688, Seq. ID No. 2690, Seq. ID No. 2692, Seq. ID No. 2694, Seq. ID No. 2696, Seq. ID No. 2698, Seq. ID No. 2700, Seq. ID No. 2704, Seq. ID No. 2710, Seq. ID No. 2712, Seq. ID No. 2716, Seq. ID No. 2718, Seq. ID No. 2720, Seq. ID No. 2724, Seq. ID No. 2726, Seq. ID No. 2728, Seq. ID No. 2730, Seq. ID No. 2732, Seq. ID No. 2736, Seq. ID No. 2738, Seq. ID No. 2740, Seq. ID No. 2750, Seq. ID No. 2752, Seq. ID No. 2754, Seq. ID No. 2756, Seq. ID No. 2760, Seq. ID No. 2766, Seq. ID No. 2768, Seq. ID No. 2770, Seq. ID No. 2772, Seq. ID No. 2774, Seq. ID No. 2776, Seq. ID No. 2780, Seq. ID No. 2782, Seq. ID No. 2784, Seq. ID No. 2788, Seq. ID No. 2790, Seq. ID No. 2792, Seq. ID No. 2794, Seq. ID No. 2796, Seq. ID No. 2798, Seq. ID No. 2800, Seq. ID No. 2802, Seq. ID No. 2804, Seq. ID No. 2808, Seq. ID No. 2810, Seq. ID No. 2814, Seq. ID No. 2816, Seq. ID No. 2822, Seq. ID No. 2824, Seq. ID No. 2828, Seq. ID No. 2830, Seq. ID No. 2832, Seq. ID No. 2834, Seq. ID No. 2840, Seq. ID No. 2842, Seq. ID No. 2844, Seq. ID No. 2846, Seq. ID No. 2848, Seq. ID No. 2856, Seq. ID No. 2862, Seq. ID No. 2864, Seq. ID No. 2866, Seq. ID No. 2868, Seq. ID No. 2870, Seq. ID No. 2872, Seq. ID No. 2878, Seq. ID No. 2882, Seq. ID No. 2884, Seq. ID No. 2886, Seq. ID No. 2888, Seq. ID No. 2892, Seq. ID No. 2894, Seq. ID No. 2896, Seq. ID No. 2900, Seq. ID No. 2902, Seq. ID No. 2908, Seq. ID No. 2916, Seq. ID No. 2918, Seq. ID No. 2920, Seq. ID No. 2922, Seq. ID No. 2924, Seq. ID No. 2928, Seq. ID No. 2932, Seq. ID No. 2934, Seq. ID No. 2936, Seq. ID No. 2944, Seq. ID No. 2946, Seq. ID No. 2952, Seq. ID No. 2954, Seq. ID No. 2958, Seq. ID No. 2960, Seq. ID No. 2962, Seq. ID No. 2964, Seq. ID No. 2966, Seq. ID No. 2968, Seq. ID No. 2972, Seq. ID No. 2974, Seq. ID No. 2976, Seq. ID No. 2978, Seq. ID No. 2980, Seq. ID No. 2984, Seq. ID No. 2986, Seq. ID No. 2988, Seq. ID No. 2992, Seq. ID No. 2994, Seq. ID No. 3000, Seq. ID No. 3002, Seq. ID No. 3006, Seq. ID No. 3010, Seq. ID No. 3012, Seq. ID No. 3016, Seq. ID No. 3018, Seq. ID No. 3020, Seq. ID No. 3022, Seq. ID No. 3028, Seq. ID No. 3034, Seq. ID No. 3036, Seq. ID No. 3038, Seq. ID No. 3040, Seq. ID No. 3044, Seq. ID No. 3046, Seq. ID No. 3048, Seq. ID No. 3050, Seq. ID No. 3052, Seq. ID No. 3054, Seq. ID No. 3056, Seq. ID No. 3058, Seq. ID No. 3060, Seq. ID No. 3068, Seq. ID No. 3070, Seq. ID No. 3072, Seq. ID No. 3080, Seq. ID No. 3084, Seq. ID No. 3086, Seq. ID No. 3088, Seq. ID No. 3092, Seq. ID No. 3094, Seq. ID No. 3100, Seq. ID No. 3102, Seq. ID No. 3104, Seq. ID No. 3110, Seq. ID No. 3112, Seq. ID No. 3116, Seq. ID No. 3118, Seq. ID No. 3120,

Seq. ID No. 3122, Seq. ID No. 3124, Seq. ID No. 3126, Seq. ID No. 3130, Seq. ID No. 3132, Seq. ID No. 3134, Seq. ID No. 3136, Seq. ID No. 3138, Seq. ID No. 3140, Seq. ID No. 3142, Seq. ID No. 3144, Seq. ID No. 3148, Seq. ID No. 3150, Seq. ID No. 3152, Seq. ID No. 3154, Seq. ID No. 3156, Seq. ID No. 3158, Seq. ID No. 3160, Seq. ID No. 3162, Seq. ID No. 3166, Seq. ID No. 3168, Seq. ID No. 3170, Seq. ID No. 3172, Seq. ID No. 3174, Seq. ID No. 3180, Seq. ID No. 3182, Seq. ID No. 3184, Seq. ID No. 3186, Seq. ID No. 3188, Seq. ID No. 3190, Seq. ID No. 3192, Seq. ID No. 3194, Seq. ID No. 3196, Seq. ID No. 3198, Seq. ID No. 3204, Seq. ID No. 3206, Seq. ID No. 3208, Seq. ID No. 3210, Seq. ID No. 3212, Seq. ID No. 3218, Seq. ID No. 3224, Seq. ID No. 3226, Seq. ID No. 3228, Seq. ID No. 3230, Seq. ID No. 3236, Seq. ID No. 3250, Seq. ID No. 3252, Seq. ID No. 3254, Seq. ID No. 3256, Seq. ID No. 3258, Seq. ID No. 3260, Seq. ID No. 3264, Seq. ID No. 3266, Seq. ID No. 3270, Seq. ID No. 3272, Seq. ID No. 3274, Seq. ID No. 3278, Seq. ID No. 3282, Seq. ID No. 3284, Seq. ID No. 3286, Seq. ID No. 3290, Seq. ID No. 3292, Seq. ID No. 3294, Seq. ID No. 3300, Seq. ID No. 3302, Seq. ID No. 3304, Seq. ID No. 3306, Seq. ID No. 3308, Seq. ID No. 3310, Seq. ID No. 3312, Seq. ID No. 3314, Seq. ID No. 3316, Seq. ID No. 3320, Seq. ID No. 3322, Seq. ID No. 3324, Seq. ID No. 3326, Seq. ID No. 3332, Seq. ID No. 3336, Seq. ID No. 3338, Seq. ID No. 3340, Seq. ID No. 3342, Seq. ID No. 3346, Seq. ID No. 3348, Seq. ID No. 3350, Seq. ID No. 3354, Seq. ID No. 3356, Seq. ID No. 3360, Seq. ID No. 3362, Seq. ID No. 3364, Seq. ID No. 3366, Seq. ID No. 3368, Seq. ID No. 3370, Seq. ID No. 3372, Seq. ID No. 3374, Seq. ID No. 3376, Seq. ID No. 3378, Seq. ID No. 3380, Seq. ID No. 3382, Seq. ID No. 3384, Seq. ID No. 3398, Seq. ID No. 3400, Seq. ID No. 3402, Seq. ID No. 3408, Seq. ID No. 3410, Seq. ID No. 3414, Seq. ID No. 3416, Seq. ID No. 3420, Seq. ID No. 3426, Seq. ID No. 3428, Seq. ID No. 3432, Seq. ID No. 3434, Seq. ID No. 3436, Seq. ID No. 3440, Seq. ID No. 3442, Seq. ID No. 3444, Seq. ID No. 3446, Seq. ID No. 3448, Seq. ID No. 3456, Seq. ID No. 3458, Seq. ID No. 3460, Seq. ID No. 3462, Seq. ID No. 3466, Seq. ID No. 3468, Seq. ID No. 3472, Seq. ID No. 3474, Seq. ID No. 3476, Seq. ID No. 3480, Seq. ID No. 3484, Seq. ID No. 3486, Seq. ID No. 3488, Seq. ID No. 3490, Seq. ID No. 3496, Seq. ID No. 3498, Seq. ID No. 3500, Seq. ID No. 3502, Seq. ID No. 3506, Seq. ID No. 3508, Seq. ID No. 3510, Seq. ID No. 3512, Seq. ID No. 3514, Seq. ID No. 3518, Seq. ID No. 3520, Seq. ID No. 3522, Seq. ID No. 3526, Seq. ID No. 3530, Seq. ID No. 3532, Seq. ID No. 3534, Seq. ID No. 3536, Seq. ID No. 3538, Seq. ID No. 3540, Seq. ID No. 3542, Seq. ID No. 3544, Seq. ID No. 3546, Seq. ID No. 3548,

Seq. ID No. 3550, Seq. ID No. 3552, Seq. ID No. 3554, Seq. ID No. 3556, Seq. ID No. 3558, Seq. ID No. 3560, Seq. ID No. 3562, Seq. ID No. 3564, Seq. ID No. 3566, Seq. ID No. 3568, Seq. ID No. 3570, Seq. ID No. 3572, Seq. ID No. 3574, Seq. ID No. 3576, Seq. ID No. 3580, Seq. ID No. 3582, Seq. ID No. 3584, Seq. ID No. 3588, Seq. ID No. 3590, Seq. ID No. 3596, Seq. ID No. 3598, Seq. ID No. 3600, Seq. ID No. 3604, Seq. ID No. 3606, Seq. ID No. 3608, Seq. ID No. 3610, Seq. ID No. 3612, Seq. ID No. 3614, Seq. ID No. 3616, Seq. ID No. 3618, Seq. ID No. 3620, Seq. ID No. 3622, Seq. ID No. 3624, Seq. ID No. 3628, Seq. ID No. 3630, Seq. ID No. 3636, Seq. ID No. 3638, Seq. ID No. 3640, Seq. ID No. 3642, Seq. ID No. 3646, Seq. ID No. 3648, Seq. ID No. 3650, Seq. ID No. 3652, Seq. ID No. 3654, Seq. ID No. 3658, Seq. ID No. 3660, Seq. ID No. 3664, Seq. ID No. 3666, Seq. ID No. 3668, Seq. ID No. 3672, Seq. ID No. 3674, Seq. ID No. 3676, Seq. ID No. 3678, Seq. ID No. 3680, Seq. ID No. 3682, Seq. ID No. 3684, Seq. ID No. 3686, Seq. ID No. 3688, Seq. ID No. 3690, Seq. ID No. 3692, Seq. ID No. 3694, Seq. ID No. 3696, Seq. ID No. 3700, Seq. ID No. 3702, Seq. ID No. 3704, Seq. ID No. 3706, Seq. ID No. 3708, Seq. ID No. 3710, Seq. ID No. 3714, Seq. ID No. 3716, Seq. ID No. 3718, Seq. ID No. 3728, Seq. ID No. 3730, Seq. ID No. 3734, Seq. ID No. 3738, Seq. ID No. 3740, Seq. ID No. 3742, Seq. ID No. 3746, Seq. ID No. 3748, Seq. ID No. 3760, Seq. ID No. 3768, Seq. ID No. 3770, Seq. ID No. 3772, Seq. ID No. 3780, Seq. ID No. 3784, Seq. ID No. 3786, Seq. ID No. 3790, Seq. ID No. 3792, Seq. ID No. 3796, Seq. ID No. 3798, Seq. ID No. 3804, Seq. ID No. 3806, Seq. ID No. 3808, Seq. ID No. 3810, Seq. ID No. 3812, Seq. ID No. 3814, Seq. ID No. 3816, Seq. ID No. 3818, Seq. ID No. 3820, Seq. ID No. 3824, Seq. ID No. 3826, Seq. ID No. 3832, Seq. ID No. 3834, Seq. ID No. 3836, Seq. ID No. 3842, Seq. ID No. 3844, Seq. ID No. 3848, Seq. ID No. 3856, Seq. ID No. 3858, Seq. ID No. 3864, Seq. ID No. 3868, Seq. ID No. 3872, Seq. ID No. 3874, Seq. ID No. 3876, Seq. ID No. 3878, Seq. ID No. 3882, Seq. ID No. 3884, Seq. ID No. 3886, Seq. ID No. 3894, Seq. ID No. 3896, Seq. ID No. 3900, Seq. ID No. 3902, Seq. ID No. 3906, Seq. ID No. 3908, Seq. ID No. 3912, Seq. ID No. 3914, Seq. ID No. 3916, Seq. ID No. 3920, Seq. ID No. 3922, Seq. ID No. 3924, Seq. ID No. 3926, Seq. ID No. 3928, Seq. ID No. 3930, Seq. ID No. 3932, Seq. ID No. 3934, Seq. ID No. 3936, Seq. ID No. 3940, Seq. ID No. 3942, Seq. ID No. 3944, Seq. ID No. 3946, Seq. ID No. 3948, Seq. ID No. 3950, Seq. ID No. 3952, Seq. ID No. 3954, Seq. ID No. 3956, Seq. ID No. 3958, Seq. ID No. 3960, Seq. ID No. 3962, Seq. ID No. 3966, Seq. ID No. 3968, Seq. ID No. 3970, Seq. ID No. 3972, Seq. ID No. 3976, Seq. ID No. 3980,

Seq. ID No. 3982, Seq. ID No. 3984, Seq. ID No. 3986, Seq. ID No. 3988, Seq. ID No. 3992, Seq. ID No. 3996, Seq. ID No. 3998, Seq. ID No. 4000, Seq. ID No. 4004, Seq. ID No. 4008, Seq. ID No. 4010, Seq. ID No. 4016, Seq. ID No. 4018, Seq. ID No. 4022, Seq. ID No. 4024, Seq. ID No. 4030, Seq. ID No. 4036, Seq. ID No. 4038, Seq. ID No. 4040, Seq. ID No. 4050, Seq. ID No. 4052, Seq. ID No. 4054, Seq. ID No. 4056, Seq. ID No. 4058, Seq. ID No. 4062, Seq. ID No. 4076, Seq. ID No. 4080, Seq. ID No. 4086, Seq. ID No. 4088, Seq. ID No. 4090, Seq. ID No. 4092, Seq. ID No. 4094, Seq. ID No. 4096, Seq. ID No. 4100, Seq. ID No. 4106, Seq. ID No. 4108, Seq. ID No. 4110, Seq. ID No. 4112, Seq. ID No. 4114, Seq. ID No. 4118, Seq. ID No. 4120, Seq. ID No. 4122, Seq. ID No. 4124, Seq. ID No. 4126, Seq. ID No. 4128, Seq. ID No. 4130, Seq. ID No. 4132, Seq. ID No. 4134, Seq. ID No. 4136, Seq. ID No. 4138, Seq. ID No. 4140, Seq. ID No. 4142, Seq. ID No. 4144, Seq. ID No. 4146, Seq. ID No. 4150, Seq. ID No. 4154, Seq. ID No. 4156, Seq. ID No. 4158, Seq. ID No. 4162, Seq. ID No. 4164, Seq. ID No. 4168, Seq. ID No. 4172, Seq. ID No. 4174, Seq. ID No. 4176, Seq. ID No. 4178, Seq. ID No. 4180, Seq. ID No. 4182, Seq. ID No. 4186, Seq. ID No. 4188, Seq. ID No. 4190, Seq. ID No. 4192, Seq. ID No. 4194, Seq. ID No. 4196, Seq. ID No. 4198, Seq. ID No. 4200, Seq. ID No. 4204, Seq. ID No. 4206, Seq. ID No. 4208, Seq. ID No. 4210, Seq. ID No. 4212, Seq. ID No. 4220, Seq. ID No. 4230, Seq. ID No. 4234, Seq. ID No. 4236, Seq. ID No. 4238, Seq. ID No. 4240, Seq. ID No. 4244, Seq. ID No. 4250, Seq. ID No. 4252, Seq. ID No. 4254, Seq. ID No. 4256, Seq. ID No. 4260, Seq. ID No. 4264, Seq. ID No. 4266, Seq. ID No. 4268, Seq. ID No. 4270, Seq. ID No. 4272, Seq. ID No. 4274, Seq. ID No. 4276, Seq. ID No. 4282, Seq. ID No. 4284, Seq. ID No. 4286, Seq. ID No. 4288, Seq. ID No. 4290, Seq. ID No. 4292, Seq. ID No. 4294, Seq. ID No. 4296, Seq. ID No. 4298, Seq. ID No. 4300, Seq. ID No. 4302, Seq. ID No. 4304, Seq. ID No. 4308, Seq. ID No. 4310, Seq. ID No. 4314, Seq. ID No. 4316, Seq. ID No. 4318, Seq. ID No. 4320, Seq. ID No. 4322, Seq. ID No. 4324, Seq. ID No. 4326, Seq. ID No. 4330, Seq. ID No. 4332, Seq. ID No. 4334, Seq. ID No. 4336, Seq. ID No. 4338, Seq. ID No. 4340, Seq. ID No. 4344, Seq. ID No. 4346, Seq. ID No. 4348, Seq. ID No. 4352, Seq. ID No. 4354, Seq. ID No. 4356, Seq. ID No. 4360, Seq. ID No. 4362, Seq. ID No. 4364, Seq. ID No. 4366, Seq. ID No. 4368, Seq. ID No. 4370, Seq. ID No. 4376, Seq. ID No. 4378, Seq. ID No. 4380, Seq. ID No. 4384, Seq. ID No. 4390, Seq. ID No. 4392, Seq. ID No. 4394, Seq. ID No. 4396, Seq. ID No. 4398, Seq. ID No. 4400, Seq. ID No. 4402, Seq. ID No. 4404, Seq. ID No. 4406, Seq. ID No. 4408, Seq. ID No. 4410, Seq. ID No. 4412,

Seq. ID No. 4414, Seq. ID No. 4416, Seq. ID No. 4418, Seq. ID No. 4420, Seq. ID No. 4422, Seq. ID No. 4424, Seq. ID No. 4426, Seq. ID No. 4428, Seq. ID No. 4430, Seq. ID No. 4432, Seq. ID No. 4436, Seq. ID No. 4438, Seq. ID No. 4440, Seq. ID No. 4442, Seq. ID No. 4450, Seq. ID No. 4452, Seq. ID No. 4454, Seq. ID No. 4456, Seq. ID No. 4458, Seq. ID No. 4460, Seq. ID No. 4462, Seq. ID No. 4466, Seq. ID No. 4468, Seq. ID No. 4472, Seq. ID No. 4476, Seq. ID No. 4478, Seq. ID No. 4480, Seq. ID No. 4482, Seq. ID No. 4486, Seq. ID No. 4488, Seq. ID No. 4490, Seq. ID No. 4492, Seq. ID No. 4494, Seq. ID No. 4496, Seq. ID No. 4498, Seq. ID No. 4502, Seq. ID No. 4504, Seq. ID No. 4506, Seq. ID No. 4508, Seq. ID No. 4510, Seq. ID No. 4512, Seq. ID No. 4514, Seq. ID No. 4516, Seq. ID No. 4520, Seq. ID No. 4522, Seq. ID No. 4524, Seq. ID No. 4526, Seq. ID No. 4528, Seq. ID No. 4530, Seq. ID No. 4532, Seq. ID No. 4534, Seq. ID No. 4538, Seq. ID No. 4542, Seq. ID No. 4546, Seq. ID No. 4548, Seq. ID No. 4550, Seq. ID No. 4552, Seq. ID No. 4554, Seq. ID No. 4556, Seq. ID No. 4560, Seq. ID No. 4562, Seq. ID No. 4566, Seq. ID No. 4568, Seq. ID No. 4572, Seq. ID No. 4574, Seq. ID No. 4576, Seq. ID No. 4578, Seq. ID No. 4582, Seq. ID No. 4586, Seq. ID No. 4590, Seq. ID No. 4592, Seq. ID No. 4598, Seq. ID No. 4600, Seq. ID No. 4602, Seq. ID No. 4604, Seq. ID No. 4606, Seq. ID No. 4608, Seq. ID No. 4610, Seq. ID No. 4612, Seq. ID No. 4614, Seq. ID No. 4616, Seq. ID No. 4618, Seq. ID No. 4620, Seq. ID No. 4622, Seq. ID No. 4624, Seq. ID No. 4628, Seq. ID No. 4632, Seq. ID No. 4638, Seq. ID No. 4642, Seq. ID No. 4644, Seq. ID No. 4646, Seq. ID No. 4648, Seq. ID No. 4650, Seq. ID No. 4654, Seq. ID No. 4660, Seq. ID No. 4662, Seq. ID No. 4664, Seq. ID No. 4666, Seq. ID No. 4668, Seq. ID No. 4670, Seq. ID No. 4672, Seq. ID No. 4674, Seq. ID No. 4676, Seq. ID No. 4678, Seq. ID No. 4680, Seq. ID No. 4684, Seq. ID No. 4686, Seq. ID No. 4688, Seq. ID No. 4692, Seq. ID No. 4694, Seq. ID No. 4696, Seq. ID No. 4700, Seq. ID No. 4702, Seq. ID No. 4704, Seq. ID No. 4706, Seq. ID No. 4714, Seq. ID No. 4718, Seq. ID No. 4720, Seq. ID No. 4722, Seq. ID No. 4728, Seq. ID No. 4730, Seq. ID No. 4734, Seq. ID No. 4736, Seq. ID No. 4738, Seq. ID No. 4740, Seq. ID No. 4742, Seq. ID No. 4744, Seq. ID No. 4748, Seq. ID No. 4750, Seq. ID No. 4752, Seq. ID No. 4756, Seq. ID No. 4758, Seq. ID No. 4764, Seq. ID No. 4766, Seq. ID No. 4768, Seq. ID No. 4770, Seq. ID No. 4774, Seq. ID No. 4776, Seq. ID No. 4778, Seq. ID No. 4780, Seq. ID No. 4782, Seq. ID No. 4788, Seq. ID No. 4790, Seq. ID No. 4792, Seq. ID No. 4794, Seq. ID No. 4796, Seq. ID No. 4798, Seq. ID No. 4802, Seq. ID No. 4804, Seq. ID No. 4806, Seq. ID No. 4810, Seq. ID No. 4812, Seq. ID No. 4814, Seq. ID No. 4816,

Seq. ID No. 4818, Seq. ID No. 4820, Seq. ID No. 4826, Seq. ID No. 4828, Seq. ID No. 4830, Seq. ID No. 4832, Seq. ID No. 4834, Seq. ID No. 4838, Seq. ID No. 4840, Seq. ID No. 4842, Seq. ID No. 4844, Seq. ID No. 4846, Seq. ID No. 4850, Seq. ID No. 4852, Seq. ID No. 4854, Seq. ID No. 4856, Seq. ID No. 4862, Seq. ID No. 4864, Seq. ID No. 4868, Seq. ID No. 4876, Seq. ID No. 4878, Seq. ID No. 4880, Seq. ID No. 4882, Seq. ID No. 4884, Seq. ID No. 4890, Seq. ID No. 4892, Seq. ID No. 4894, Seq. ID No. 4896, Seq. ID No. 4898, Seq. ID No. 4900, Seq. ID No. 4902, Seq. ID No. 4904, Seq. ID No. 4906, Seq. ID No. 4908, Seq. ID No. 4910, Seq. ID No. 4912, Seq. ID No. 4914, Seq. ID No. 4916, Seq. ID No. 4918, Seq. ID No. 4920, Seq. ID No. 4922, Seq. ID No. 4924, Seq. ID No. 4928, Seq. ID No. 4932, Seq. ID No. 4936, Seq. ID No. 4938, Seq. ID No. 4940, Seq. ID No. 4942, Seq. ID No. 4944, Seq. ID No. 4946, Seq. ID No. 4948, Seq. ID No. 4950, Seq. ID No. 4952, Seq. ID No. 4954, Seq. ID No. 4958, Seq. ID No. 4960, Seq. ID No. 4962, Seq. ID No. 4964, Seq. ID No. 4974, Seq. ID No. 4976, Seq. ID No. 4978, Seq. ID No. 4980, Seq. ID No. 4982, Seq. ID No. 4984, Seq. ID No. 4986, Seq. ID No. 4988, Seq. ID No. 4990, Seq. ID No. 4992, Seq. ID No. 4994, Seq. ID No. 4996, Seq. ID No. 4998, Seq. ID No. 5000, Seq. ID No. 5004, Seq. ID No. 5006, Seq. ID No. 5008, Seq. ID No. 5010, Seq. ID No. 5012, Seq. ID No. 5014, Seq. ID No. 5018, Seq. ID No. 5020, Seq. ID No. 5022, Seq. ID No. 5024, Seq. ID No. 5026, Seq. ID No. 5030, Seq. ID No. 5032, Seq. ID No. 5034, Seq. ID No. 5036, Seq. ID No. 5042, Seq. ID No. 5044, Seq. ID No. 5046, Seq. ID No. 5048, Seq. ID No. 5058, Seq. ID No. 5060, Seq. ID No. 5064, Seq. ID No. 5066, Seq. ID No. 5068, Seq. ID No. 5070, Seq. ID No. 5076, Seq. ID No. 5078, Seq. ID No. 5080, Seq. ID No. 5082, Seq. ID No. 5084, Seq. ID No. 5086, Seq. ID No. 5088, Seq. ID No. 5092, Seq. ID No. 5100, Seq. ID No. 5102, Seq. ID No. 5104, Seq. ID No. 5110, Seq. ID No. 5112, Seq. ID No. 5114, Seq. ID No. 5116, Seq. ID No. 5118, Seq. ID No. 5122, Seq. ID No. 5126, Seq. ID No. 5128, Seq. ID No. 5134, Seq. ID No. 5140, Seq. ID No. 5142, Seq. ID No. 5146, Seq. ID No. 5148, Seq. ID No. 5150, Seq. ID No. 5152, Seq. ID No. 5156, Seq. ID No. 5158, Seq. ID No. 5160, Seq. ID No. 5162, Seq. ID No. 5166, Seq. ID No. 5168, Seq. ID No. 5170, Seq. ID No. 5178, Seq. ID No. 5182, Seq. ID No. 5184, Seq. ID No. 5186, Seq. ID No. 5188, Seq. ID No. 5190, Seq. ID No. 5192, Seq. ID No. 5194, Seq. ID No. 5196, Seq. ID No. 5198, Seq. ID No. 5200, Seq. ID No. 5202, Seq. ID No. 5204, Seq. ID No. 5206, Seq. ID No. 5210, Seq. ID No. 5212, Seq. ID No. 5216, Seq. ID No. 5220, Seq. ID No. 5222, Seq. ID No. 5230, Seq. ID No. 5232, Seq. ID No. 5240, Seq. ID No. 5242, Seq. ID No. 5244,



Seq. ID No. 5246, Seq. ID No. 5252, Seq. ID No. 5254, Seq. ID No. 5256, Seq. ID No. 5262, Seq. ID No. 5264, Seq. ID No. 5266, Seq. ID No. 5268, Seq. ID No. 5278, Seq. ID No. 5280, Seq. ID No. 5282, Seq. ID No. 5286, Seq. ID No. 5288, Seq. ID No. 5292, Seq. ID No. 5296, Seq. ID No. 5298, Seq. ID No. 5300, Seq. ID No. 5302, Seq. ID No. 5304, Seq. ID No. 5306, Seq. ID No. 5308, Seq. ID No. 5310, Seq. ID No. 5312, Seq. ID No. 5314, Seq. ID No. 5318, Seq. ID No. 5320, Seq. ID No. 5322, Seq. ID No. 5324, Seq. ID No. 5328, Seq. ID No. 5330, Seq. ID No. 5332, Seq. ID No. 5334, Seq. ID No. 5336, Seq. ID No. 5338, Seq. ID No. 5344, Seq. ID No. 5346, Seq. ID No. 5350, Seq. ID No. 5352, Seq. ID No. 5358, Seq. ID No. 5360, Seq. ID No. 5366, Seq. ID No. 5368, Seq. ID No. 5374, Seq. ID No. 5378, Seq. ID No. 5380, Seq. ID No. 5382, Seq. ID No. 5384, Seq. ID No. 5388, Seq. ID No. 5390, Seq. ID No. 5392, Seq. ID No. 5394, Seq. ID No. 5398, Seq. ID No. 5400, Seq. ID No. 5402, Seq. ID No. 5404, Seq. ID No. 5406, Seq. ID No. 5408, Seq. ID No. 5410, Seq. ID No. 5412, Seq. ID No. 5416, Seq. ID No. 5418, Seq. ID No. 5420, Seq. ID No. 5422, Seq. ID No. 5424, Seq. ID No. 5426, Seq. ID No. 5428, Seq. ID No. 5432, Seq. ID No. 5434, Seq. ID No. 5436, Seq. ID No. 5438, Seq. ID No. 5440, Seq. ID No. 5442, Seq. ID No. 5444, Seq. ID No. 5448, Seq. ID No. 5450, Seq. ID No. 5452, Seq. ID No. 5454, Seq. ID No. 5456, Seq. ID No. 5458, Seq. ID No. 5468, Seq. ID No. 5472, Seq. ID No. 5474, Seq. ID No. 5478, Seq. ID No. 5480, Seq. ID No. 5482, Seq. ID No. 5492, Seq. ID No. 5494, Seq. ID No. 5496, Seq. ID No. 5500, Seq. ID No. 5504, Seq. ID No. 5510, Seq. ID No. 5514, Seq. ID No. 5516, Seq. ID No. 5518, Seq. ID No. 5520, Seq. ID No. 5522, Seq. ID No. 5528, Seq. ID No. 5530, Seq. ID No. 5532, Seq. ID No. 5534, Seq. ID No. 5538, Seq. ID No. 5540, Seq. ID No. 5542, Seq. ID No. 5544, Seq. ID No. 5546, Seq. ID No. 5548, Seq. ID No. 5550, Seq. ID No. 5552, Seq. ID No. 5554, Seq. ID No. 5558, Seq. ID No. 5560, Seq. ID No. 5564, Seq. ID No. 5568, Seq. ID No. 5570, Seq. ID No. 5576, Seq. ID No. 5578, Seq. ID No. 5582, Seq. ID No. 5584, Seq. ID No. 5586, Seq. ID No. 5590, Seq. ID No. 5592, Seq. ID No. 5594, Seq. ID No. 5596, Seq. ID No. 5600, Seq. ID No. 5602, Seq. ID No. 5608, Seq. ID No. 5614, Seq. ID No. 5616, Seq. ID No. 5618, Seq. ID No. 5620, Seq. ID No. 5622, Seq. ID No. 5626, Seq. ID No. 5628, Seq. ID No. 5630, Seq. ID No. 5632, Seq. ID No. 5638, Seq. ID No. 5640, Seq. ID No. 5642, Seq. ID No. 5646, Seq. ID No. 5648, Seq. ID No. 5650, Seq. ID No. 5652, Seq. ID No. 5656, Seq. ID No. 5658, Seq. ID No. 5662, Seq. ID No. 5666, Seq. ID No. 5668, Seq. ID No. 5670, Seq. ID No. 5678, Seq. ID No. 5680, Seq. ID No. 5684, Seq. ID No. 5686, Seq. ID No. 5688, Seq. ID No. 5690,

Seq. ID No. 5692, Seq. ID No. 5694, Seq. ID No. 5698, Seq. ID No. 5700, Seq. ID No. 5702, Seq. ID No. 5704, Seq. ID No. 5706, Seq. ID No. 5708, Seq. ID No. 5712, Seq. ID No. 5714, Seq. ID No. 5716, Seq. ID No. 5718, Seq. ID No. 5720, Seq. ID No. 5722, Seq. ID No. 5724, Seq. ID No. 5726, Seq. ID No. 5728, Seq. ID No. 5736, Seq. ID No. 5740, Seq. ID No. 5742, Seq. ID No. 5744, Seq. ID No. 5746, Seq. ID No. 5748, Seq. ID No. 5750, Seq. ID No. 5752, Seq. ID No. 5754, Seq. ID No. 5756, Seq. ID No. 5758, Seq. ID No. 5760, Seq. ID No. 5762, Seq. ID No. 5770, Seq. ID No. 5772, Seq. ID No. 5778, Seq. ID No. 5780, Seq. ID No. 5784, Seq. ID No. 5788, Seq. ID No. 5792, Seq. ID No. 5796, Seq. ID No. 5800, Seq. ID No. 5802, Seq. ID No. 5808, Seq. ID No. 5810, Seq. ID No. 5814, Seq. ID No. 5816, Seq. ID No. 5820, Seq. ID No. 5822, Seq. ID No. 5824, Seq. ID No. 5826, Seq. ID No. 5828, Seq. ID No. 5830, Seq. ID No. 5832, Seq. ID No. 5834, Seq. ID No. 5836, Seq. ID No. 5838, Seq. ID No. 5840, Seq. ID No. 5842, Seq. ID No. 5846, Seq. ID No. 5848, Seq. ID No. 5850, Seq. ID No. 5852, Seq. ID No. 5856, Seq. ID No. 5858, Seq. ID No. 5860, Seq. ID No. 5862, Seq. ID No. 5864, Seq. ID No. 5866, Seq. ID No. 5870, Seq. ID No. 5872, Seq. ID No. 5874, Seq. ID No. 5876, Seq. ID No. 5880, Seq. ID No. 5882, Seq. ID No. 5884, Seq. ID No. 5890, Seq. ID No. 5896, Seq. ID No. 5898, Seq. ID No. 5902, Seq. ID No. 5904, Seq. ID No. 5912, Seq. ID No. 5914, Seq. ID No. 5916, Seq. ID No. 5918, Seq. ID No. 5920, Seq. ID No. 5928, Seq. ID No. 5930, Seq. ID No. 5934, Seq. ID No. 5936, Seq. ID No. 5938, Seq. ID No. 5942, Seq. ID No. 5946, Seq. ID No. 5948, Seq. ID No. 5952, Seq. ID No. 5960, Seq. ID No. 5962, Seq. ID No. 5964, Seq. ID No. 5966, Seq. ID No. 5968, Seq. ID No. 5970, Seq. ID No. 5972, Seq. ID No. 5974, Seq. ID No. 5978, Seq. ID No. 5980, Seq. ID No. 5982, Seq. ID No. 5986, Seq. ID No. 5988, Seq. ID No. 5990, Seq. ID No. 5992, Seq. ID No. 5994, Seq. ID No. 5996, Seq. ID No. 6000, Seq. ID No. 6002, Seq. ID No. 6004, Seq. ID No. 6010, Seq. ID No. 6012, Seq. ID No. 6014, Seq. ID No. 6016, Seq. ID No. 6018, Seq. ID No. 6026, Seq. ID No. 6028, Seq. ID No. 6030, Seq. ID No. 6032, Seq. ID No. 6034, Seq. ID No. 6036, Seq. ID No. 6040, Seq. ID No. 6042, Seq. ID No. 6044, Seq. ID No. 6046, Seq. ID No. 6050, Seq. ID No. 6052, Seq. ID No. 6054, Seq. ID No. 6056, Seq. ID No. 6058, Seq. ID No. 6062, Seq. ID No. 6064, Seq. ID No. 6066, Seq. ID No. 6070, Seq. ID No. 6072, Seq. ID No. 6074, Seq. ID No. 6078, Seq. ID No. 6080, Seq. ID No. 6086, Seq. ID No. 6088, Seq. ID No. 6090, Seq. ID No. 6094, Seq. ID No. 6096, Seq. ID No. 6102, Seq. ID No. 6104, Seq. ID No. 6110, Seq. ID No. 6112, Seq. ID No. 6118, Seq. ID No. 6122, Seq. ID No. 6124, Seq. ID No. 6130, Seq. ID No. 6132,

Seq. ID No. 6134, Seq. ID No. 6136, Seq. ID No. 6138, Seq. ID No. 6140, Seq. ID No. 6142, Seq. ID No. 6146, Seq. ID No. 6152, Seq. ID No. 6156, Seq. ID No. 6158, Seq. ID No. 6160, Seq. ID No. 6166, Seq. ID No. 6168, Seq. ID No. 6170, Seq. ID No. 6172, Seq. ID No. 6176, Seq. ID No. 6178, Seq. ID No. 6182, Seq. ID No. 6188, Seq. ID No. 5 6194, Seq. ID No. 6196, Seq. ID No. 6198, Seq. ID No. 6200, Seq. ID No. 6202, Seq. ID No. 6210, Seq. ID No. 6214, Seq. ID No. 6216, Seq. ID No. 6218, Seq. ID No. 6220, Seq. ID No. 6232, Seq. ID No. 6234, Seq. ID No. 6236, Seq. ID No. 6240, Seq. ID No. 6242, Seq. ID No. 6244, Seq. ID No. 6250, Seq. ID No. 6258, Seq. ID No. 6260, Seq. ID No. 6262, Seq. ID No. 6264, Seq. ID No. 6268, Seq. ID No. 6270, Seq. ID No. 6272, 10 Seq. ID No. 6276, Seq. ID No. 6278, Seq. ID No. 6280, Seq. ID No. 6282, Seq. ID No. 6284, Seq. ID No. 6286, Seq. ID No. 6288, Seq. ID No. 6294, Seq. ID No. 6296, Seq. ID No. 6298, Seq. ID No. 6300, Seq. ID No. 6306, Seq. ID No. 6310, Seq. ID No. 6312, Seq. ID No. 6316, Seq. ID No. 6318, Seq. ID No. 6320, Seq. ID No. 6322, Seq. ID No. 6324, Seq. ID No. 6326, Seq. ID No. 6328, Seq. ID No. 6330, Seq. ID No. 6332, Seq. ID 15 No. 6336, Seq. ID No. 6338, Seq. ID No. 6342, Seq. ID No. 6346, Seq. ID No. 6350, Seq. ID No. 6352, Seq. ID No. 6354, Seq. ID No. 6360, Seq. ID No. 6362, Seq. ID No. 6368, Seq. ID No. 6370, Seq. ID No. 6372, Seq. ID No. 6374, Seq. ID No. 6376, Seq. ID No. 6378, Seq. ID No. 6380, Seq. ID No. 6382, Seq. ID No. 6386, Seq. ID No. 6390, Seq. ID No. 6394, Seq. ID No. 6396, Seq. ID No. 6400, Seq. ID No. 6410, Seq. ID No. 20 6412, Seq. ID No. 6414, Seq. ID No. 6418, Seq. ID No. 6422, Seq. ID No. 6424, Seq. ID No. 6426, Seq. ID No. 6428, Seq. ID No. 6430, Seq. ID No. 6432, Seq. ID No. 6442, Seq. ID No. 6444, Seq. ID No. 6446, Seq. ID No. 6452, Seq. ID No. 6454, Seq. ID No. 6460, Seq. ID No. 6462, Seq. ID No. 6464, Seq. ID No. 6466, Seq. ID No. 6468, Seq. ID No. 6470, Seq. ID No. 6472, Seq. ID No. 6474, Seq. ID No. 6480, Seq. ID No. 6484, 25 Seq. ID No. 6494, Seq. ID No. 6496, Seq. ID No. 6498, Seq. ID No. 6502, Seq. ID No. 6504, Seq. ID No. 6506, Seq. ID No. 6508, Seq. ID No. 6512, Seq. ID No. 6518, Seq. ID No. 6524, Seq. ID No. 6526, Seq. ID No. 6536, Seq. ID No. 6538, Seq. ID No. 6540, Seq. ID No. 6542, Seq. ID No. 6544, Seq. ID No. 6546, Seq. ID No. 6548, Seq. ID No. 6550, Seq. ID No. 6552, Seq. ID No. 6554, Seq. ID No. 6556, Seq. ID No. 6558, Seq. ID 30 No. 6560, Seq. ID No. 6564, Seq. ID No. 6574, Seq. ID No. 6576, Seq. ID No. 6578, Seq. ID No. 6580, Seq. ID No. 6584, Seq. ID No. 6586, Seq. ID No. 6588, Seq. ID No. 6592, Seq. ID No. 6598, Seq. ID No. 6602, Seq. ID No. 6604, Seq. ID No. 6606, Seq. ID No. 6610, Seq. ID No. 6612, Seq. ID No. 6614, Seq. ID No. 6616, Seq. ID No. 6618,

Seq. ID No. 6620, Seq. ID No. 6622, Seq. ID No. 6624, Seq. ID No. 6628, Seq. ID No. 6630, Seq. ID No. 6632, Seq. ID No. 6634, Seq. ID No. 6638, Seq. ID No. 6640, Seq. ID No. 6644, Seq. ID No. 6646, and Seq. ID No. 6650.

In yet another preferred embodiment, the polypeptide is selected from the  
5 *Alloiococcus otitidis* polypeptides identified by the Applicants' assignee's ORF finder program that searches for a transmembrane domain between two Stop codons and a Start codon immediately upstream of this transmembrane region, and is selected from one of Seq. ID No. 8, Seq. ID No. 10, Seq. ID No. 34, Seq. ID No. 48, Seq. ID No. 68, Seq. ID No. 86, Seq. ID No. 88, Seq. ID No. 124, Seq. ID No. 134, Seq. ID No. 142, Seq.  
10 ID No. 160, Seq. ID No. 164, Seq. ID No. 192, Seq. ID No. 210, Seq. ID No. 212, Seq. ID No. 216, Seq. ID No. 218, Seq. ID No. 226, Seq. ID No. 236, Seq. ID No. 238, Seq. ID No. 250, Seq. ID No. 252, Seq. ID No. 256, Seq. ID No. 272, Seq. ID No. 278, Seq. ID No. 286, Seq. ID No. 288, Seq. ID No. 290, Seq. ID No. 328, Seq. ID No. 330, Seq. ID No. 374, Seq. ID No. 376, Seq. ID No. 420, Seq. ID No. 488, Seq. ID No. 498, Seq. ID  
15 No. 500, Seq. ID No. 504, Seq. ID No. 506, Seq. ID No. 510, Seq. ID No. 512, Seq. ID No. 516, Seq. ID No. 526, Seq. ID No. 528, Seq. ID No. 546, Seq. ID No. 568, Seq. ID No. 570, Seq. ID No. 576, Seq. ID No. 578, Seq. ID No. 580, Seq. ID No. 594, Seq. ID No. 618, Seq. ID No. 638, Seq. ID No. 640, Seq. ID No. 642, Seq. ID No. 646, Seq. ID No. 654, Seq. ID No. 656, Seq. ID No. 660, Seq. ID No. 670, Seq. ID No. 676, Seq. ID  
20 No. 678, Seq. ID No. 680, Seq. ID No. 716, Seq. ID No. 718, Seq. ID No. 720, Seq. ID No. 722, Seq. ID No. 724, Seq. ID No. 748, Seq. ID No. 752, Seq. ID No. 756, Seq. ID No. 758, Seq. ID No. 760, Seq. ID No. 762, Seq. ID No. 764, Seq. ID No. 770, Seq. ID No. 778, Seq. ID No. 780, Seq. ID No. 808, Seq. ID No. 810, Seq. ID No. 820, Seq. ID No. 826, Seq. ID No. 864, Seq. ID No. 894, Seq. ID No. 902, Seq. ID No. 936, Seq. ID  
25 No. 944, Seq. ID No. 956, Seq. ID No. 968, Seq. ID No. 980, Seq. ID No. 1006, Seq. ID No. 1010, Seq. ID No. 1012, Seq. ID No. 1014, Seq. ID No. 1016, Seq. ID No. 1020, Seq. ID No. 1030, Seq. ID No. 1032, Seq. ID No. 1034, Seq. ID No. 1038, Seq. ID No. 1040, Seq. ID No. 1046, Seq. ID No. 1056, Seq. ID No. 1076, Seq. ID No. 1106, Seq. ID No. 1132, Seq. ID No. 1136, Seq. ID No. 1138, Seq. ID No. 1166, Seq. ID No. 1168,  
30 Seq. ID No. 1170, Seq. ID No. 1184, Seq. ID No. 1194, Seq. ID No. 1198, Seq. ID No. 1214, Seq. ID No. 1224, Seq. ID No. 1228, Seq. ID No. 1230, Seq. ID No. 1238, Seq. ID No. 1244, Seq. ID No. 1266, Seq. ID No. 1268, Seq. ID No. 1270, Seq. ID No. 1272, Seq. ID No. 1284, Seq. ID No. 1288, Seq. ID No. 1292, Seq. ID No. 1298, Seq. ID No.

1306, Seq. ID No. 1316, Seq. ID No. 1326, Seq. ID No. 1328, Seq. ID No. 1330, Seq. ID  
No. 1332, Seq. ID No. 1342, Seq. ID No. 1354, Seq. ID No. 1368, Seq. ID No. 1402,  
Seq. ID No. 1430, Seq. ID No. 1436, Seq. ID No. 1446, Seq. ID No. 1482, Seq. ID No.  
1514, Seq. ID No. 1516, Seq. ID No. 1518, Seq. ID No. 1530, Seq. ID No. 1534, Seq. ID  
5 No. 1536, Seq. ID No. 1546, Seq. ID No. 1548, Seq. ID No. 1552, Seq. ID No. 1560,  
Seq. ID No. 1564, Seq. ID No. 1572, Seq. ID No. 1580, Seq. ID No. 1584, Seq. ID No.  
1586, Seq. ID No. 1622, Seq. ID No. 1634, Seq. ID No. 1644, Seq. ID No. 1646, Seq. ID  
No. 1648, Seq. ID No. 1650, Seq. ID No. 1654, Seq. ID No. 1672, Seq. ID No. 1674,  
Seq. ID No. 1678, Seq. ID No. 1682, Seq. ID No. 1708, Seq. ID No. 1732, Seq. ID No.  
10 1734, Seq. ID No. 1738, Seq. ID No. 1754, Seq. ID No. 1758, Seq. ID No. 1766, Seq. ID  
No. 1768, Seq. ID No. 1788, Seq. ID No. 1792, Seq. ID No. 1798, Seq. ID No. 1806,  
Seq. ID No. 1820, Seq. ID No. 1822, Seq. ID No. 1824, Seq. ID No. 1840, Seq. ID No.  
1870, Seq. ID No. 1876, Seq. ID No. 1892, Seq. ID No. 1894, Seq. ID No. 1896, Seq. ID  
No. 1924, Seq. ID No. 1928, Seq. ID No. 1970, Seq. ID No. 1982, Seq. ID No. 1992,  
15 Seq. ID No. 1994, Seq. ID No. 2014, Seq. ID No. 2018, Seq. ID No. 2028, Seq. ID No.  
2034, Seq. ID No. 2042, Seq. ID No. 2050, Seq. ID No. 2054, Seq. ID No. 2088, Seq. ID  
No. 2090, Seq. ID No. 2106, Seq. ID No. 2116, Seq. ID No. 2122, Seq. ID No. 2128,  
Seq. ID No. 2152, Seq. ID No. 2160, Seq. ID No. 2172, Seq. ID No. 2174, Seq. ID No.  
2178, Seq. ID No. 2188, Seq. ID No. 2238, Seq. ID No. 2240, Seq. ID No. 2246, Seq. ID  
20 No. 2250, Seq. ID No. 2272, Seq. ID No. 2284, Seq. ID No. 2290, Seq. ID No. 2292,  
Seq. ID No. 2294, Seq. ID No. 2296, Seq. ID No. 2304, Seq. ID No. 2306, Seq. ID No.  
2308, Seq. ID No. 2318, Seq. ID No. 2320, Seq. ID No. 2322, Seq. ID No. 2324, Seq. ID  
No. 2326, Seq. ID No. 2328, Seq. ID No. 2334, Seq. ID No. 2344, Seq. ID No. 2348,  
Seq. ID No. 2350, Seq. ID No. 2352, Seq. ID No. 2354, Seq. ID No. 2356, Seq. ID No.  
25 2358, Seq. ID No. 2366, Seq. ID No. 2390, Seq. ID No. 2392, Seq. ID No. 2408, Seq. ID  
No. 2420, Seq. ID No. 2422, Seq. ID No. 2428, Seq. ID No. 2430, Seq. ID No. 2434,  
Seq. ID No. 2450, Seq. ID No. 2460, Seq. ID No. 2490, Seq. ID No. 2498, Seq. ID No.  
2504, Seq. ID No. 2508, Seq. ID No. 2516, Seq. ID No. 2524, Seq. ID No. 2526, Seq. ID  
No. 2532, Seq. ID No. 2536, Seq. ID No. 2538, Seq. ID No. 2542, Seq. ID No. 2544,  
30 Seq. ID No. 2546, Seq. ID No. 2556, Seq. ID No. 2558, Seq. ID No. 2570, Seq. ID No.  
2572, Seq. ID No. 2584, Seq. ID No. 2592, Seq. ID No. 2598, Seq. ID No. 2600, Seq. ID  
No. 2602, Seq. ID No. 2608, Seq. ID No. 2612, Seq. ID No. 2622, Seq. ID No. 2630,  
Seq. ID No. 2652, Seq. ID No. 2680, Seq. ID No. 2694, Seq. ID No. 2702, Seq. ID No.

2704, Seq. ID No. 2706, Seq. ID No. 2708, Seq. ID No. 2732, Seq. ID No. 2734, Seq. ID  
No. 2784, Seq. ID No. 2786, Seq. ID No. 2814, Seq. ID No. 2816, Seq. ID No. 2824,  
Seq. ID No. 2836, Seq. ID No. 2838, Seq. ID No. 2842, Seq. ID No. 2854, Seq. ID No.  
2874, Seq. ID No. 2876, Seq. ID No. 2882, Seq. ID No. 2906, Seq. ID No. 2936, Seq. ID  
5 No. 2938, Seq. ID No. 2940, Seq. ID No. 2942, Seq. ID No. 2948, Seq. ID No. 2950,  
Seq. ID No. 2970, Seq. ID No. 2974, Seq. ID No. 2978, Seq. ID No. 2982, Seq. ID No.  
2988, Seq. ID No. 2992, Seq. ID No. 2996, Seq. ID No. 2998, Seq. ID No. 3006, Seq. ID  
No. 3008, Seq. ID No. 3014, Seq. ID No. 3024, Seq. ID No. 3026, Seq. ID No. 3028,  
Seq. ID No. 3030, Seq. ID No. 3032, Seq. ID No. 3044, Seq. ID No. 3056, Seq. ID No.  
10 3064, Seq. ID No. 3072, Seq. ID No. 3074, Seq. ID No. 3076, Seq. ID No. 3078, Seq. ID  
No. 3124, Seq. ID No. 3146, Seq. ID No. 3156, Seq. ID No. 3158, Seq. ID No. 3164,  
Seq. ID No. 3184, Seq. ID No. 3194, Seq. ID No. 3202, Seq. ID No. 3214, Seq. ID No.  
3216, Seq. ID No. 3218, Seq. ID No. 3220, Seq. ID No. 3242, Seq. ID No. 3244, Seq. ID  
No. 3246, Seq. ID No. 3250, Seq. ID No. 3258, Seq. ID No. 3262, Seq. ID No. 3270,  
15 Seq. ID No. 3276, Seq. ID No. 3298, Seq. ID No. 3318, Seq. ID No. 3324, Seq. ID No.  
3338, Seq. ID No. 3340, Seq. ID No. 3350, Seq. ID No. 3352, Seq. ID No. 3354, Seq. ID  
No. 3358, Seq. ID No. 3360, Seq. ID No. 3378, Seq. ID No. 3390, Seq. ID No. 3392,  
Seq. ID No. 3396, Seq. ID No. 3406, Seq. ID No. 3422, Seq. ID No. 3426, Seq. ID No.  
3450, Seq. ID No. 3452, Seq. ID No. 3454, Seq. ID No. 3456, Seq. ID No. 3458, Seq. ID  
20 No. 3464, Seq. ID No. 3482, Seq. ID No. 3492, Seq. ID No. 3494, Seq. ID No. 3504,  
Seq. ID No. 3506, Seq. ID No. 3528, Seq. ID No. 3594, Seq. ID No. 3596, Seq. ID No.  
3622, Seq. ID No. 3626, Seq. ID No. 3636, Seq. ID No. 3680, Seq. ID No. 3724, Seq. ID  
No. 3728, Seq. ID No. 3746, Seq. ID No. 3754, Seq. ID No. 3756, Seq. ID No. 3758,  
Seq. ID No. 3762, Seq. ID No. 3764, Seq. ID No. 3766, Seq. ID No. 3784, Seq. ID No.  
25 3794, Seq. ID No. 3800, Seq. ID No. 3814, Seq. ID No. 3838, Seq. ID No. 3840, Seq. ID  
No. 3850, Seq. ID No. 3852, Seq. ID No. 3854, Seq. ID No. 3860, Seq. ID No. 3862,  
Seq. ID No. 3864, Seq. ID No. 3866, Seq. ID No. 3880, Seq. ID No. 3890, Seq. ID No.  
3892, Seq. ID No. 3904, Seq. ID No. 3926, Seq. ID No. 3964, Seq. ID No. 3974, Seq. ID  
No. 3976, Seq. ID No. 4006, Seq. ID No. 4026, Seq. ID No. 4028, Seq. ID No. 4040,  
30 Seq. ID No. 4042, Seq. ID No. 4044, Seq. ID No. 4046, Seq. ID No. 4048, Seq. ID No.  
4062, Seq. ID No. 4072, Seq. ID No. 4074, Seq. ID No. 4080, Seq. ID No. 4082, Seq. ID  
No. 4084, Seq. ID No. 4102, Seq. ID No. 4104, Seq. ID No. 4112, Seq. ID No. 4134,  
Seq. ID No. 4138, Seq. ID No. 4140, Seq. ID No. 4146, Seq. ID No. 4152, Seq. ID No.

4222, Seq. ID No. 4224, Seq. ID No. 4226, Seq. ID No. 4228, Seq. ID No. 4232, Seq. ID  
No. 4242, Seq. ID No. 4248, Seq. ID No. 4254, Seq. ID No. 4258, Seq. ID No. 4262,  
Seq. ID No. 4308, Seq. ID No. 4312, Seq. ID No. 4314, Seq. ID No. 4344, Seq. ID No.  
4380, Seq. ID No. 4386, Seq. ID No. 4390, Seq. ID No. 4440, Seq. ID No. 4470, Seq. ID  
5 No. 4474, Seq. ID No. 4482, Seq. ID No. 4484, Seq. ID No. 4486, Seq. ID No. 4498,  
Seq. ID No. 4516, Seq. ID No. 4534, Seq. ID No. 4588, Seq. ID No. 4640, Seq. ID No.  
4644, Seq. ID No. 4682, Seq. ID No. 4706, Seq. ID No. 4708, Seq. ID No. 4710, Seq. ID  
No. 4712, Seq. ID No. 4716, Seq. ID No. 4718, Seq. ID No. 4738, Seq. ID No. 4760,  
Seq. ID No. 4814, Seq. ID No. 4828, Seq. ID No. 4870, Seq. ID No. 4872, Seq. ID No.  
10 4874, Seq. ID No. 4876, Seq. ID No. 4920, Seq. ID No. 4932, Seq. ID No. 4950, Seq. ID  
No. 4952, Seq. ID No. 4988, Seq. ID No. 5032, Seq. ID No. 5062, Seq. ID No. 5086,  
Seq. ID No. 5104, Seq. ID No. 5124, Seq. ID No. 5130, Seq. ID No. 5132, Seq. ID No.  
5136, Seq. ID No. 5138, Seq. ID No. 5142, Seq. ID No. 5166, Seq. ID No. 5176, Seq. ID  
No. 5200, Seq. ID No. 5206, Seq. ID No. 5208, Seq. ID No. 5214, Seq. ID No. 5220,  
15 Seq. ID No. 5224, Seq. ID No. 5268, Seq. ID No. 5282, Seq. ID No. 5386, Seq. ID No.  
5388, Seq. ID No. 5414, Seq. ID No. 5416, Seq. ID No. 5434, Seq. ID No. 5454, Seq. ID  
No. 5460, Seq. ID No. 5462, Seq. ID No. 5464, Seq. ID No. 5466, Seq. ID No. 5492,  
Seq. ID No. 5498, Seq. ID No. 5510, Seq. ID No. 5514, Seq. ID No. 5526, Seq. ID No.  
5532, Seq. ID No. 5570, Seq. ID No. 5588, Seq. ID No. 5596, Seq. ID No. 5598, Seq. ID  
20 No. 5610, Seq. ID No. 5612, Seq. ID No. 5622, Seq. ID No. 5624, Seq. ID No. 5634,  
Seq. ID No. 5638, Seq. ID No. 5644, Seq. ID No. 5650, Seq. ID No. 5660, Seq. ID No.  
5684, Seq. ID No. 5686, Seq. ID No. 5700, Seq. ID No. 5706, Seq. ID No. 5710, Seq. ID  
No. 5730, Seq. ID No. 5734, Seq. ID No. 5764, Seq. ID No. 5766, Seq. ID No. 5768,  
Seq. ID No. 5772, Seq. ID No. 5784, Seq. ID No. 5792, Seq. ID No. 5798, Seq. ID No.  
25 5886, Seq. ID No. 5890, Seq. ID No. 5894, Seq. ID No. 5896, Seq. ID No. 5900, Seq. ID  
No. 5902, Seq. ID No. 5906, Seq. ID No. 5910, Seq. ID No. 5922, Seq. ID No. 5924,  
Seq. ID No. 5928, Seq. ID No. 5940, Seq. ID No. 6028, Seq. ID No. 6044, Seq. ID .No.  
6048, Seq. ID No. 6060, Seq. ID No. 6068, Seq. ID No. 6090, Seq. ID No. 6092, Seq. ID  
No. 6108, Seq. ID No. 6112, Seq. ID No. 6118, Seq. ID No. 6162, Seq. ID No. 6164,  
30 Seq. ID No. 6166, Seq. ID No. 6170, Seq. ID No. 6184, Seq. ID No. 6186, Seq. ID No.  
6190, Seq. ID No. 6192, Seq. ID No. 6198, Seq. ID No. 6204, Seq. ID No. 6206, Seq. ID  
No. 6210, Seq. ID No. 6222, Seq. ID No. 6224, Seq. ID No. 6226, Seq. ID No. 6228,  
Seq. ID No. 6230, Seq. ID No. 6236, Seq. ID No. 6238, Seq. ID No. 6244, Seq. ID No.

6246, Seq. ID No. 6250, Seq. ID No. 6254, Seq. ID No. 6264, Seq. ID No. 6266, Seq. ID No. 6274, Seq. ID No. 6276, Seq. ID No. 6286, Seq. ID No. 6290, Seq. ID No. 6302, Seq. ID No. 6304, Seq. ID No. 6364, Seq. ID No. 6378, Seq. ID No. 6382, Seq. ID No. 6384, Seq. ID No. 6416, Seq. ID No. 6428, Seq. ID No. 6432, Seq. ID No. 6474, Seq. ID No. 6498, Seq. ID No. 6572, Seq. ID No. 6582, Seq. ID No. 6594, Seq. ID No. 6600, Seq. ID No. 6632, and Seq. ID No. 6640.

In another aspect of the invention, the polypeptides are expressed and purified in a recombinant expression system. Thus, in certain embodiments, the invention provides a recombinant expression vector comprising a nucleotide sequence having at least about 70% identity to a nucleotide sequence chosen from one of odd numbered sequences set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a complement thereof, a degenerate variant thereof, or a fragment thereof.

In certain other embodiments, the polynucleotide is selected from the group consisting of genomic DNA, cDNA, and RNA. In another embodiment, the polynucleotide comprised within the vector further comprises heterologous nucleotide sequences.

In other embodiments, the polynucleotide is operatively linked to one or more gene expression regulatory elements. In yet other embodiments, the polynucleotide encodes a polypeptide comprising an amino acid sequence having at least about 70% identity to an amino acid sequence chosen from one of even numbered sequences set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a complement thereof, a biological equivalent thereof, or a fragment thereof. In a preferred embodiment, the vector is a plasmid.

In another aspect of the invention, provided is a genetically engineered host cell, transfected, transformed or infected with a recombinant expression vector comprising a nucleotide sequence having at least about 70% identity to a nucleotide sequence chosen from one of odd numbered sequences set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a complement thereof, a degenerate variant thereof, or a fragment thereof. In a preferred embodiment, the host cell is a bacterial cell. In a further embodiment, the polynucleotide is expressed to produce the encoded polypeptide, a complement thereof, a biological equivalent thereof, or a fragment thereof.

In another aspect of the invention, the polypeptides are expressed and purified in a recombinant expression system. Thus, in certain embodiments, the invention provides



a recombinant expression vector comprising a nucleotide sequence having at least about 70% identity to a nucleotide sequence chosen from one of odd numbered sequences set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a complement thereof, a degenerate variant thereof, or a fragment thereof. In certain other embodiments, the polynucleotide  
5 is selected from the group consisting of genomic DNA, cDNA, and RNA. In another embodiment, the polynucleotide comprised within the vector further comprises heterologous nucleotide sequences.

In other embodiments, the present invention provides an antibody specific for an *Alloiococcus otitidis* polynucleotide chosen from one of odd numbered sequences set out  
10 in SEQ ID NO: 1 through SEQ ID NO: 6649, a fragment thereof, a degenerate variant thereof, or an antibody specific for an *Alloiococcus otitidis* polypeptide chosen from one of even numbered sequences set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof. In certain embodiments, the antibody is selected from the group consisting of monoclonal, polyclonal, chimeric,  
15 human, humanized and single chain. In a preferred embodiment, the antibody is monoclonal. In another preferred embodiment, the antibody is humanized.

The present invention further provides pharmaceutical compositions, in particular immunogenic compositions, for the prevention and/or treatment of bacterial infection. Thus, in one embodiment an immunogenic composition is provided comprising one or  
20 more polypeptides having an amino acid sequence chosen from one or more of even

numbered sequences set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof. In certain embodiments, the composition further comprises a pharmaceutically acceptable carrier. In yet other embodiments, the immunogenic composition further comprises one or more adjuvants. In preferred

5       embodiments the polypeptide of the invention is further defined as: (a) an *Alloiococcus otitidis* polypeptide predicted by SignalP algorithm analysis as having met all four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and a subset of these are predicted by HMM SignalP algorithm analysis as having a signal peptide; (b)

10       an *Alloiococcus otitidis* polypeptide predicted by SignalP algorithm analysis as having met three of the four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and a subset of these predicted by HMM SignalP algorithm analysis as having a signal peptide; (c) an *Alloiococcus otitidis* polypeptide predicted by HMM

15       SignalP algorithm analysis as having a signal peptide; (d) an *Alloiococcus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as being a non-secretory protein; (e) an *Alloiococcus otitidis* polypeptide identified by Pfam analysis; (f) an *Alloiococcus otitidis* polypeptide identified by BlastP analysis as being secreted, surface exposed, vaccine candidate; (g) an *Alloiococcus otitidis* polypeptide identified using proteomics methodology as sharing homology with surface exposed proteins of *Streptococcus pneumoniae*; (h) an *Alloiococcus otitidis* polypeptide having a LPXTG

20       motif, wherein the polypeptide is covalently attached to the peptidoglycan layer; (i) an *Alloiococcus otitidis* lipoprotein; (j) an *Alloiococcus otitidis* polypeptide non-covalently associated with the peptidoglycan layer; (k) an *Alloiococcus otitidis* polypeptide having an RGD<sub>X</sub> motif wherein X is not a proline residue; (l) an *Alloiococcus otitidis* polypeptide predicted by BlastP as being involved in capsule biosynthesis and transport; (m) an

25       *Alloiococcus otitidis* polypeptide identified by BlastP as being localized within the capsule loci of the *Alloiococcus otitidis* genome; (n) an *Alloiococcus otitidis* polypeptide predicted by BlastP as being associated with sporulation; (o) an *Alloiococcus otitidis* polypeptide encoded by unique ORFs identified by BlastP analysis as having a BlastP 'E Value' of  $> e^{-10}$ ; (p) an *Alloiococcus otitidis* polypeptide identified by Glimmer™ ORF finder

30       program; (q) an *Alloiococcus otitidis* polypeptide identified by GeneMark™ ORF finder program; (r) an *Alloiococcus otitidis* polypeptide identified by Applicants' assignee's ORF finder program that searches for an ATG, GTG or TTG Start codon between a Stop-Stop region; and (s) an *Alloiococcus otitidis* polypeptide identified by Applicants' assignee's

ORF finder program that searches for a transmembrane domain between two Stop codons and a Start codon immediately upstream of this transmembrane region.

In one preferred embodiment, the invention comprises an isolated polypeptide encoded by a polynucleotide contained within the *Alloiococcus otitidis* genomic  
5 sequence, wherein the polynucleotide comprises a nucleotide sequence having at least about 70% identity to a nucleotide sequence contained within SEQ ID NO: 6651, a complement thereof, a degenerate variant thereof, and a fragment thereof.

In certain other embodiments, the immunogenic composition further comprises heterologous amino acids. In particular embodiments, the polypeptide is a fusion  
10 polypeptide.

In further embodiments, provided is an immunogenic composition comprising a polynucleotide having a nucleotide sequence chosen from one of odd numbered sequences listed in SEQ ID NO: 1 through SEQ ID NO: 6649, a degenerate variant thereof, or a fragment thereof and is comprised in an expression vector. In preferred  
15 embodiments, the vector is plasmid DNA. In another embodiment, the polynucleotide comprises heterologous nucleotides. In still other embodiments, the polynucleotide is operatively linked to one or more gene expression regulatory elements. In yet other embodiments, the polynucleotide directs the expression of a neutralizing epitope of *Alloiococcus otitidis*. In preferred embodiments, the immunogenic composition further  
20 comprises one or more adjuvants.

In yet further embodiments, provided is a pharmaceutical composition comprising a polypeptide and a pharmaceutically acceptable carrier, wherein the polypeptide comprises an amino acid chosen from one of even numbered sequence listings set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a complement thereof, a biological  
25 equivalent thereof, or a fragment thereof. In preferred embodiments the polypeptide of the invention is further defined as: (a) an *Alloiococcus otitidis* polypeptide predicted by SignalP algorithm analysis as having met all four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and a subset of these are predicted by HMM SignalP algorithm analysis as having a signal peptide; (b) an *Alloiococcus otitidis*  
30 polypeptide predicted by SignalP algorithm analysis as having met three of the four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and a subset of these predicted by HMM SignalP algorithm analysis as having a signal peptide; (c) an *Alloiococcus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as

having a signal peptide; (d) an *Alloicoccus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as being a non-secretory protein; (e) an *Alloicoccus otitidis* polypeptide identified by Pfam analysis; (f) an *Alloicoccus otitidis* polypeptide identified by BlastP analysis as being secreted, surface exposed, vaccine; (g) an *Alloicoccus*  
 5 *otitidis* polypeptide identified using proteomics methodology as sharing homology with surface exposed proteins of *Streptococcus pneumoniae*; (h) an *Alloicoccus otitidis* polypeptide having a LPXTG motif, wherein the polypeptide is covalently attached to the peptidoglycan layer; (i) an *Alloicoccus otitidis* lipoprotein; (j) an *Alloicoccus otitidis* polypeptide non-covalently associated with the peptidoglycan layer; (k) an *Alloicoccus*  
 10 *otitidis* polypeptide having an RGD<sub>X</sub> motif wherein X is not a proline residue; (l) an *Alloicoccus otitidis* polypeptide predicted by BlastP as being involved in capsule biosynthesis and transport; (m) an *Alloicoccus otitidis* polypeptide identified by BlastP as being localized within the capsule loci of the *Alloicoccus otitidis* genome; (n) an *Alloicoccus otitidis* polypeptide predicted by BlastP as being associated with  
 15 sporulation; (o) an *Alloicoccus otitidis* polypeptide encoded by unique ORFs identified by BlastP analysis as having a BlastP 'E Value' of  $> e^{-10}$ ; (p) an *Alloicoccus otitidis* polypeptide identified by Glimmer™ ORF finder program; (q) an *Alloicoccus otitidis* polypeptide identified by GeneMark™ ORF finder program; (r) an *Alloicoccus otitidis* polypeptide identified by Applicants' assignee's ORF finder program that searches for an  
 20 ATG, GTG or TTG start codon between a Stop-Stop region; and (s) an *Alloicoccus otitidis* polypeptide identified by Applicants' assignee's ORF finder program that searches for a transmembrane domain between two Stop codons and a Start codon immediately upstream of this transmembrane region.

In another embodiment, a method of immunizing against *Alloicoccus otitidis* is  
 25 provided comprising administering to a host an immunizing amount of an immunogenic composition comprising a polypeptide and a pharmaceutically acceptable carrier, wherein the polypeptide comprises an amino acid sequence chosen from one of even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof. In certain embodiments, the polypeptide is a  
 30 fusion polypeptide. In other embodiments, the method further comprises administering an adjuvant.

In other embodiments the polypeptides of the invention comprise heterologous amino acids. In still other embodiments, the polypeptide in the pharmaceutical composition is a fusion polypeptide.

Other embodiments of the invention provide a DNA chip comprising an array of  
5 polynucleotides, wherein at least one of the polynucleotides comprise a nucleotide sequence chosen from one of odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, a complement thereof, a degenerate variant thereof, or a fragment thereof.

Also provided is a protein chip comprising an array of polypeptides, wherein at  
10 least one of the polypeptides comprises an amino acid sequence chosen from one of even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof.

The invention further provides methods of detecting *Alloiococcus otitidis* polynucleotides and polypeptides as well as kits for diagnosing *Alloiococcus otitidis*  
15 infection. Other embodiments provide a method for the detection and/or identification of *Alloiococcus otitidis* in a biological sample comprising contacting the sample with an oligonucleotide probe of a polynucleotide comprising the nucleotide sequence chosen from one of odd numbered sequences is set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, a degenerate variant thereof, or a fragment thereof, under conditions permitting  
20 hybridization and detecting the presence of hybridization complexes in the sample, wherein hybridization complexes indicate the presence of *Alloiococcus otitidis* in the sample.

Still other embodiments provide a method for the detection and/or identification of *Alloiococcus otitidis* in a biological sample comprising nucleotide sequence chosen from  
25 one of odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, a degenerate variant thereof, or a fragment thereof, in the presence of nucleotides and a polymerase enzyme under conditions permitting primer extension and detecting the presence of primer extension products in the sample, wherein extension products indicate the presence of *Alloiococcus otitidis* in the sample.

Further embodiments provide a method for the detection and/or identification of  
30 *Alloiococcus otitidis* in a biological sample comprising contacting the sample with an antibody specific for a polypeptide comprising an amino acid sequence chosen from one of even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a

biological equivalent thereof, or a fragment thereof, under conditions permitting immune complex formation and detecting the presence of immune complexes in the sample, wherein immune complexes indicate the presence of *Alloiococcus otitidis* in the sample.

In certain embodiments, provided is a method for the detection and/or  
5 identification of antibodies to *Alloiococcus otitidis* in a biological sample comprising contacting the sample with a polypeptide comprising an amino acid sequence chosen from one of even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof, under conditions permitting immune complex formation and detecting the presence of immune complexes in the  
10 sample, wherein immune complexes indicate the presence of *Alloiococcus otitidis* in the sample.

Other embodiments of the invention provide a kit comprising a container containing an isolated polynucleotide comprising a nucleotide sequence chosen from one of odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, a  
15 degenerate variant thereof, or a fragment thereof. In a preferred embodiment, the polynucleotide is a primer or a probe, wherein when the polynucleotide is a primer, the kit further comprises a container containing a polymerase. In another embodiment, the kit further comprises a container containing dNTP.

Provided further is a kit comprising a container containing an antibody that  
20 immunospecifically binds to a polypeptide comprising the amino acid sequence chosen from one of even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof.

Provided also is a kit comprising a container containing an antibody that immunospecifically binds to a fusion polypeptide comprising at least the amino acid  
25 sequence chosen from one of even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof.

In a preferred embodiment of the invention, there is provided a genetically engineered host cell, transfected, transformed or infected with a recombinant expression vector comprising a nucleotide sequence having at least about 70% identity to a  
30 nucleotide sequence chosen from one of odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, a complement thereof, a degenerate variant thereof, or a fragment thereof under conditions suitable to produce one of the polypeptides of even

numbered sequences set out in SEQ ID NO: 2 through SEQ ID NO: 6650; and recovering the polypeptide.

Other features and advantages of the invention will be apparent from the following detailed description, from the preferred embodiments thereof, and from the claims.

#### **DETAILED DESCRIPTION OF THE INVENTION**

The invention described herein addresses the need for an *Alloiococcus otitidis* immunogenic composition that is effective in preventing most or all of the disease caused by *Alloiococcus otitidis*. The invention further addresses the need for methods of diagnosing *Alloiococcus otitidis* infection. The Applicants have identified novel *Alloiococcus otitidis* open reading frames (ORFs), which encode antigenic polypeptides. More particularly, the newly identified ORFs encode polypeptides that are surface localized (*i.e.*, exposed) on *Alloiococcus otitidis*, and thus serve as potential antigenic polypeptides in immunogenic compositions. Thus, in certain embodiments, the invention comprises *Alloiococcus otitidis* polynucleotide ORFs encoding surface localized polypeptide antigens. In other embodiments, the present invention comprises surface localized antigenic polypeptides, encoded by the *Alloiococcus otitidis* ORFs.

In other embodiments, the invention comprises vectors comprising ORF sequences and host cells or animals transformed with these vectors. The invention also comprises transcriptional gene products of *Alloiococcus otitidis* ORFs, including, but not limited to mRNA, antisense RNA, antisense oligonucleotides, and ribozyme molecules, which are used to inhibit or control growth of the microorganism. The invention relates also to methods of detecting *Alloiococcus otitidis* nucleic acids or polypeptides and kits for diagnosing *Alloiococcus otitidis* infection. The invention also relates to pharmaceutical compositions, in particular immunogenic compositions, for the prevention and/or treatment of bacterial infection, in particular infection caused by or exacerbated by *Alloiococcus otitidis*. In particular embodiments, the immunogenic compositions are used for the treatment or prevention of non-systemic diseases, particularly of the otitis media, which are induced or exacerbated by *Alloiococcus otitidis*.

#### **A. IDENTIFYING ORFs WITHIN THE GENOMIC SEQUENCE OF *ALLOIOCOCCUS OTITIDIS***

The invention is directed in particular embodiments to the identification of polynucleotides, more particularly ORFs, which encode *Alloiococcus otitidis* polypeptides. The availability of the bacterial genomic sequences has begun to play an important role in the identification of vaccine candidates through genomics, transcriptional profiling, and proteomics, coupled with the information processing capabilities of bioinformatics (McAtee *et al.*, 1998a; McAtee *et al.*, 1998b; Pizza *et al.*, 2000; Sonnenberg and Belisle, 1997; Weldingh *et al.*, 1998; McAtee *et al.*, 1998c). Thus, the Applicants have analyzed the *Alloiococcus otitidis* genomic sequences and utilized bioinformatics tools to identify the ORFs encoding polypeptides of the present invention. As described below, the ORFs were analyzed for a variety of characteristics.

Specifically, an extensive genomic analysis was performed *in silico* of the *Alloiococcus otitidis* genome using algorithms designed to identify genes that encode novel surface localized polypeptides or polypeptides with putative similarity to surface localized polypeptides in other organisms. Thus, a combined analysis of the *Alloiococcus otitidis* genome, using a unique set of three ORF finder algorithms (*i.e.*, GLIMMER™, Salzberg *et al.*, 1998, GeneMark™ (Lukashin and Borodovsky, 1998) and the Applicants' assignee's own programs), identified 3325 ORFs. The most stringent of the ORF finders; Glimmer™, identified 1529 ORFs; GeneMark™ identified 1,534 ORFs, while Applicants' assignee's ORF finders identified the most with 2706 ORFs.

For the purposes of this application, all ORFs with common stop codons are given the same ORF designation and will be treated as if they are the same ORF. In a number of instances, there are multiple start codons within a given ORF. These proteins of different length are indicated by a lower case letter suffix after the ORF number. For example, as shown in Table 2 below, ORF number 4a has a protein start beginning at nucleotide 3733, ORF number 4b has a protein start beginning at nucleotide 3049, and 4c has a protein start beginning or ending at nucleotide 2854 (these three sequences share a common ORF stop codon beginning at nucleotide 4152). As used herein, an ORF is defined as having one of three potential start site codons, ATG, GTG, TTG and one of three potential stop codons, TAA, TAG, TGA. The lower limit of amino acid length used (*e.g.*, ~74 amino acids) may also cause the algorithms to overlook some reading frames. However, "true" reading frames become an increasingly rare as the ORFs become shorter.



The initial annotation of the *Alloiococcus otitidis* ORFs was performed using the Basic Local Alignment Search Tool (BLAST; version 2.0) Gapped search algorithm, BlastP, to identify homologous sequences (Altschul *et al.*, 1997). A cutoff "E" value of anything  $< e^{-10}$  was considered significant. The non-redundant protein sequence  
5 databases used for the homology searches consisted of GenBank, SWISS-PROT, PIR, and TREMBL; these database sequences are updated daily. In the present invention, ORFs with a BlastP 'E' value result of  $> e^{-10}$  are considered to be unique to *Alloiococcus otitidis*. Alternate quantitative expression values other than BlastP "E", *e.g.*, percent identity, may also be used to compare database sequences with the *Alloiococcus otitidis*  
10 ORFs of the present invention.

A keyword search of the entire BLAST results was carried out using known or suspected target genes for immunogenic compositions, as well as using words that identified the location of a protein or function.

Several parameters were used to determine the partitioning of the predicted  
15 *Alloiococcus otitidis* polypeptides of the invention. For example, polypeptides destined for translocation across the cytoplasmic membrane encode a leader signal (also called signal sequence) composed of a central hydrophobic region flanked at the N-terminus by positively charged residues (Pugsley, 1993). A software program, called SignalP, which identifies signal peptides and their cleavage sites based on neural networks (Nielsen *et al.*, 1997), was used in the present invention to analyze the amino acid sequence of an  
20 ORF for such signal peptides. The first 60 N-terminal amino acids of each ORF were analyzed by SignalP software using the Gram-positive software database. The output generated four separate values: maximum C, maximum Y, maximum S, and mean S. The S-score, or signal region, is the probability of the position belonging to the signal  
25 peptide. The C-score, or cleavage site, is the probability of the position being the first in the mature protein. The Y-score is the geometric average of the C-score and a smoothed derivative of the S-score. A conclusion of either a Yes or No is given next to each score. If all four conclusions are Yes, then a 'YES' is listed for that ORF (*see* Table 3 below); if three of the conclusions are Yes, then a 'yes' is listed for that ORF (*see*  
30 Table 4 below); if two of the conclusions are Yes, then a 'maybe' is listed for that ORF; for all other cases, a 'No' is listed for that ORF (*see* Table 5 below).

A software program, called HMM SignalP, which identifies signal peptides and their cleavage sites based on hidden Markov models (Nielsen *et al.*, 1997), was used in

the present invention to analyze the amino acid sequence of an ORF for such signal peptides. The first 60 N-terminal amino acids of each ORF were analyzed by HMM SignalP software using the Gram-positive software database. The output generates a value from 0.00 to 1.00, whereby any value greater than 0.5 is listed as being a 'Signal Peptide' (see Table 5 below) and any value less than 0.5 is listed as being a 'Non-Secretory Protein' (see Table 6 below).

To predict polypeptide localization in bacteria, the software program PSORT was used (Nakai, 1991). PSORT predicts localization of polypeptides to the 'cytoplasm', the 'periplasm', and/or the 'cytoplasmic membrane' for Gram-positive bacteria, as well as the 'outer membrane' for Gram-negative bacteria. Transmembrane (TM) domains of polypeptides were analyzed using the software program TopPred2 (Cserzo *et al.*, 1997) (see Table 6 below).

The Hidden Markov Model (HMM) Pfam database (Sonnhammer, 1998) was used to identify *Alloicoccus otitidis* proteins that may belong to an existing protein family (see Table 7 below). Keyword searching of this output was further used to help identify additional vaccine candidates that may have been missed by the BLAST search criteria (see Table 8 below).

The Applicants also used proteomic methods that had previously been used for studying surface exposed proteins in *Streptococcus pneumoniae* to identify 242 ORFs of *Alloicoccus otitidis* that share some homology with ORFs encoding surface exposed proteins on *Streptococcus pneumoniae* (see Table 9).

The Applicants also developed a HMM using approximately 70 known prokaryotic proteins containing the LPXTG cell wall sorting signal, in order to predict cell wall proteins that are anchored to the peptidoglycan layer (Mazmanian *et al.*, 1999; Navarre and Schneewind, 1999). The model used not only the LPXTG sequence, but also included two features of the downstream sequence; first the hydrophobic transmembrane domain and second, the positively charged carboxy-terminus (see Table 10).

A computer algorithm, called HMM Lipo, was developed by Applicant's assignee to predict lipoproteins using 131 biologically proven bacterial lipoproteins. The protein sequence from the start of the protein to the cysteine amino acid, plus the next two additional amino acids, were used to generate the HMM (Eddy, 1996) (see Table 11).

There are also a number of proteins that interact, non-covalently, with the peptidoglycan layer and are distinct from the LPXTG protein class described above. These proteins seem to have a consensus sequence at their carboxy terminus (Koebnik, 1995). The Applicants therefore developed and used a HMM of this region to identify  
5 any *Alloiococcus otitidis* genome-encoded proteins that may fall into this class of proteins (see Table 12).

Proteins that contain Arg-Gly-Asp (RGD) attachment motif, together with integrins that serve as their receptor, constitute a major recognition system for cell adhesion, and thus are putative *Alloiococcus otitidis* cell surface antigens. RGD recognition is one  
10 mechanism used by microbes to gain entry into eukaryotic tissues (Stockbauer *et al.*, 1999, Isberg and Nhieu, 1994). However, not all RGD-containing proteins mediate cell attachment. It has been demonstrated that RGD-containing peptides with a proline at the carboxy end (RDGP) are inactive in cell attachment assays (Pierschbacher and Rouslahti, 1987) and will be excluded from consideration. About 125 surface localized  
15 ORFs were identified that were found to contain the peptide sequence RDGX where X is not proline (see Table 13).

ORFs whose BlastP results predict for proteins that may be involved in capsule biosynthesis and transport were also identified based on BlastP analysis. In addition, three potential capsule loci within the *Alloiococcus otitidis* genome were also identified  
20 based BlastP analysis (see Tables 14 and 15).

BlastP analysis was also used to identify ORFs associated with sporulation in *Alloiococcus otitidis* (see Tables 16).

BlastP analysis of the *Alloiococcus otitidis* genomic sequence also resulted in the identification of 913 unique ORFs, or 653 unique Stop-Stop ORFs, that were shown to  
25 have a BlastP 'E Value' of  $> e^{-10}$  (see Table 17).

Three different ORF finder programs were also used to identify ORFs encoding polypeptides that could potentially be used in immunogenic compositions. Using the Glimmer™ ORF finder program 1530 ORFs were identified (see Table 18). Using the GeneMark™ ORF finder program 1536 ORFs were identified (see Table 19). The  
30 Applicants also identified 2343 ORFs using the ORF finder program of Applicant's assignee, which searches for one of the three potential Start codons between a Stop-Stop regions. It first looks for a 'ATG' Start codon but will accept either a 'GTG' or 'TTG' Start codon if found first (see Table 20). The Applicants' assignee's ORF finder program

also detected 615 ORFs containing putative transmembrane regions. The program searches for putative transmembrane regions between two Stop codons and a Start codon immediately upstream of this region (see Table 21).

5           The entire genomic sequence of the isolated *Alloiococcus otitidis* is set out in Seq. ID No. 6651. *Alloiococcus otitidis* ORFs encoding proteins/polypeptides that are contained within this genomic sequence can also be used in immunogenic compositions.

A complete listing of all the ORFs of *Alloiococcus otitidis* based on the above characteristics, and which are used in immunogenic compositions, is set out in Table 2.

10           In addition, Tables 3-21 represent 19 groups into which the ORFs identified according to the above characteristics of present invention have been classified. Thus, all of the groups described below are ORFs comprised within the *Alloiococcus otitidis* genome and identified as encoding putative surface localized polypeptides. These groups are not meant to limit the scope of the present invention, as analysis of additional  
15 ORF characteristics is contemplated. These additional characteristics, e.g., RGD sequence, may serve to further expand the total number of ORF groupings or to parse the presently identified ORFs into more defined groups, broader groups, narrower groups or group subsets. In addition, some ORFs will meet the criteria of more than one category, and will therefore appear in more than one of the following groups.

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1	Seq. ID No. 1	1149	1146	280	Seq. ID No. 2
2a	Seq. ID No. 3	2227	2143	1271	Seq. ID No. 4
2b	Seq. ID No. 5	2227	2203	1271	Seq. ID No. 6
4a	Seq. ID No. 7	2827	3733	4152	Seq. ID No. 8
4b	Seq. ID No. 9	2827	3049	4152	Seq. ID No. 10
4c	Seq. ID No. 11	2827	2854	4152	Seq. ID No. 12
5	Seq. ID No. 13	5020	5011	4295	Seq. ID No. 14
7	Seq. ID No. 15	5792	5780	5001	Seq. ID No. 16
10	Seq. ID No. 17	7828	7807	5783	Seq. ID No. 18
11	Seq. ID No. 19	6198	6216	6449	Seq. ID No. 20
13a	Seq. ID No. 21	6900	6879	6589	Seq. ID No. 22
16	Seq. ID No. 23	7100	7139	7390	Seq. ID No. 24
17	Seq. ID No. 25	8265	8247	7804	Seq. ID No. 26
18	Seq. ID No. 27	9571	9517	8210	Seq. ID No. 28
20	Seq. ID No. 29	10605	10605	9514	Seq. ID No. 30
21b	Seq. ID No. 31	9485	9497	9793	Seq. ID No. 32
23a	Seq. ID No. 33	11845	11374	10595	Seq. ID No. 34
23b	Seq. ID No. 35	11845	11830	10595	Seq. ID No. 36
24	Seq. ID No. 37	12908	12905	11823	Seq. ID No. 38
32	Seq. ID No. 39	15875	15875	15789	Seq. ID No. 40
36	Seq. ID No. 41	19431	19386	18634	Seq. ID No. 42
37	Seq. ID No. 43	19372	19429	20076	Seq. ID No. 44
38a	Seq. ID No. 45	21796	21769	20186	Seq. ID No. 46
38b	Seq. ID No. 47	21796	21772	20186	Seq. ID No. 48
39a	Seq. ID No. 49	22265	22238	21786	Seq. ID No. 50
39b	Seq. ID No. 51	22265	22262	21786	Seq. ID No. 52
40	Seq. ID No. 53	23449	23437	22238	Seq. ID No. 54
41a	Seq. ID No. 55	24645	24183	23434	Seq. ID No. 56

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
41b	Seq. ID No. 57	24645	24402	23434	Seq. ID No. 58
41c	Seq. ID No. 59	24645	24630	23434	Seq. ID No. 60
43b	Seq. ID No. 61	25392	25353	24997	Seq. ID No. 62
43c	Seq. ID No. 63	25392	25359	24997	Seq. ID No. 64
44a	Seq. ID No. 65	25001	25028	25330	Seq. ID No. 66
44b	Seq. ID No. 67	25001	25016	25330	Seq. ID No. 68
45	Seq. ID No. 69	25702	25654	25403	Seq. ID No. 70
46a	Seq. ID No. 71	26225	26141	25800	Seq. ID No. 72
46b	Seq. ID No. 73	26225	26153	25800	Seq. ID No. 74
47	Seq. ID No. 75	27661	27643	26195	Seq. ID No. 76
48a	Seq. ID No. 77	29105	28781	27696	Seq. ID No. 78
48b	Seq. ID No. 79	29105	28973	27696	Seq. ID No. 80
48c	Seq. ID No. 81	29105	29090	27696	Seq. ID No. 82
50	Seq. ID No. 83	30169	30154	29102	Seq. ID No. 84
51a	Seq. ID No. 85	31759	31072	30353	Seq. ID No. 86
51b	Seq. ID No. 87	31759	31693	30353	Seq. ID No. 88
51c	Seq. ID No. 89	31759	31741	30353	Seq. ID No. 90
55	Seq. ID No. 91	32149	32128	31895	Seq. ID No. 92
56b	Seq. ID No. 93	32234	32231	31968	Seq. ID No. 94
57a	Seq. ID No. 95	33738	33723	32455	Seq. ID No. 96
57b	Seq. ID No. 97	33738	33732	32455	Seq. ID No. 98
58	Seq. ID No. 99	32611	32644	32934	Seq. ID No. 100
60a	Seq. ID No. 101	34825	34786	33947	Seq. ID No. 102
60b	Seq. ID No. 103	34825	34804	33947	Seq. ID No. 104
61	Seq. ID No. 105	34344	34344	34751	Seq. ID No. 106
62a	Seq. ID No. 107	36496	36334	34877	Seq. ID No. 108
62b	Seq. ID No. 109	36496	36415	34877	Seq. ID No. 110
62c	Seq. ID No. 111	36496	36484	34877	Seq. ID No. 112
63a	Seq. ID No. 113	35069	35102	35563	Seq. ID No. 114

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
63b	Seq. ID No. 115	35069	35072	35563	Seq. ID No. 116
65a	Seq. ID No. 117	37245	37158	36634	Seq. ID No. 118
65b	Seq. ID No. 119	37245	37203	36634	Seq. ID No. 120
65c	Seq. ID No. 121	37245	37242	36634	Seq. ID No. 122
66a	Seq. ID No. 123	36563	36749	37030	Seq. ID No. 124
67	Seq. ID No. 125	37706	37694	37254	Seq. ID No. 126
69	Seq. ID No. 127	38141	38078	37803	Seq. ID No. 128
71	Seq. ID No. 129	37829	37862	38722	Seq. ID No. 130
73a	Seq. ID No. 131	39233	39248	39472	Seq. ID No. 132
73b	Seq. ID No. 133	39233	39245	39472	Seq. ID No. 134
74	Seq. ID No. 135	38701	38719	40068	Seq. ID No. 136
77	Seq. ID No. 137	40223	40232	41029	Seq. ID No. 138
79	Seq. ID No. 139	41098	41098	41607	Seq. ID No. 140
80a	Seq. ID No. 141	41294	41375	41902	Seq. ID No. 142
80b	Seq. ID No. 143	41294	41354	41902	Seq. ID No. 144
80c	Seq. ID No. 145	41294	41300	41902	Seq. ID No. 146
81a	Seq. ID No. 147	42667	42658	42107	Seq. ID No. 148
81b	Seq. ID No. 149	42667	42664	42107	Seq. ID No. 150
83	Seq. ID No. 151	42875	42875	43096	Seq. ID No. 152
85a	Seq. ID No. 153	43769	43976	44563	Seq. ID No. 154
85b	Seq. ID No. 155	43769	43829	44563	Seq. ID No. 156
85c	Seq. ID No. 157	43769	43811	44563	Seq. ID No. 158
86	Seq. ID No. 159	44846	44825	44592	Seq. ID No. 160
87a	Seq. ID No. 161	45417	45315	45064	Seq. ID No. 162
87b	Seq. ID No. 163	45417	45351	45064	Seq. ID No. 164
87c	Seq. ID No. 165	45417	45402	45064	Seq. ID No. 166
88	Seq. ID No. 167	44548	44560	45258	Seq. ID No. 168
89	Seq. ID No. 169	45592	45550	45296	Seq. ID No. 170
91a	Seq. ID No. 171	45068	45278	46252	Seq. ID No. 172

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
91b	Seq. ID No. 173	45068	45194	46252	Seq. ID No. 174
91c	Seq. ID No. 175	45068	45107	46252	Seq. ID No. 176
91d	Seq. ID No. 177	45068	45074	46252	Seq. ID No. 178
93a	Seq. ID No. 179	46421	46619	47563	Seq. ID No. 180
93b	Seq. ID No. 181	46421	46454	47563	Seq. ID No. 182
93c	Seq. ID No. 183	46421	46436	47563	Seq. ID No. 184
94	Seq. ID No. 185	47630	47630	47830	Seq. ID No. 186
95b	Seq. ID No. 187	48482	48413	47895	Seq. ID No. 188
97b	Seq. ID No. 189	48738	48723	48421	Seq. ID No. 190
99	Seq. ID No. 191	50295	50280	48739	Seq. ID No. 192
101	Seq. ID No. 193	49736	49766	50266	Seq. ID No. 194
102	Seq. ID No. 195	51996	51981	50311	Seq. ID No. 196
104a	Seq. ID No. 197	52783	52738	52130	Seq. ID No. 198
104b	Seq. ID No. 199	52783	52753	52130	Seq. ID No. 200
104c	Seq. ID No. 201	52783	52780	52130	Seq. ID No. 202
105a	Seq. ID No. 203	53486	53087	52710	Seq. ID No. 204
105b	Seq. ID No. 205	53486	53375	52710	Seq. ID No. 206
106	Seq. ID No. 207	53716	53695	53102	Seq. ID No. 208
109a	Seq. ID No. 209	54828	54606	53938	Seq. ID No. 210
109b	Seq. ID No. 211	54828	54780	53938	Seq. ID No. 212
109c	Seq. ID No. 213	54828	54807	53938	Seq. ID No. 214
109d	Seq. ID No. 215	54828	54825	53938	Seq. ID No. 216
111a	Seq. ID No. 217	55748	55580	54822	Seq. ID No. 218
111b	Seq. ID No. 219	55748	55748	54822	Seq. ID No. 220
112a	Seq. ID No. 221	56518	56494	55745	Seq. ID No. 222
112b	Seq. ID No. 223	56518	56503	55745	Seq. ID No. 224
114	Seq. ID No. 225	57489	57459	56506	Seq. ID No. 226
115	Seq. ID No. 227	57509	57536	58264	Seq. ID No. 228
119a	Seq. ID No. 229	58330	58573	59388	Seq. ID No. 230



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
119b	Seq. ID No. 231	58330	58354	59388	Seq. ID No. 232
121	Seq. ID No. 233	59528	59540	60505	Seq. ID No. 234
124a	Seq. ID No. 235	60496	61084	62028	Seq. ID No. 236
124b	Seq. ID No. 237	60496	60913	62028	Seq. ID No. 238
124c	Seq. ID No. 239	60496	60502	62028	Seq. ID No. 240
125	Seq. ID No. 241	62724	62700	62170	Seq. ID No. 242
127a	Seq. ID No. 243	63580	63556	62900	Seq. ID No. 244
127b	Seq. ID No. 245	63580	63559	62900	Seq. ID No. 246
127c	Seq. ID No. 247	63580	63565	62900	Seq. ID No. 248
129a	Seq. ID No. 249	65731	64381	63731	Seq. ID No. 250
129b	Seq. ID No. 251	65731	64777	63731	Seq. ID No. 252
129c	Seq. ID No. 253	65731	65728	63731	Seq. ID No. 254
132a	Seq. ID No. 255	64857	64902	65162	Seq. ID No. 256
132b	Seq. ID No. 257	64857	64875	65162	Seq. ID No. 258
132c	Seq. ID No. 259	64857	64860	65162	Seq. ID No. 260
134	Seq. ID No. 261	66670	66667	65753	Seq. ID No. 262
135a	Seq. ID No. 263	67444	67423	66671	Seq. ID No. 264
135b	Seq. ID No. 265	67444	67444	66671	Seq. ID No. 266
137a	Seq. ID No. 267	68103	68073	67597	Seq. ID No. 268
137b	Seq. ID No. 269	68103	68100	67597	Seq. ID No. 270
138a	Seq. ID No. 271	70062	69996	68104	Seq. ID No. 272
138b	Seq. ID No. 273	70062	70032	68104	Seq. ID No. 274
142	Seq. ID No. 275	70135	70213	70539	Seq. ID No. 276
143	Seq. ID No. 277	71697	71697	70765	Seq. ID No. 278
144a	Seq. ID No. 279	72593	72506	71721	Seq. ID No. 280
144b	Seq. ID No. 281	72593	72545	71721	Seq. ID No. 282
144c	Seq. ID No. 283	72593	72563	71721	Seq. ID No. 284
145a	Seq. ID No. 285	74289	72996	72706	Seq. ID No. 286
145b	Seq. ID No. 287	74289	73896	72706	Seq. ID No. 288

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
145c	Seq. ID No. 289	74289	74157	72706	Seq. ID No. 290
145d	Seq. ID No. 291	74289	74226	72706	Seq. ID No. 292
147	Seq. ID No. 293	74501	74504	75694	Seq. ID No. 294
151a	Seq. ID No. 295	77145	77184	78218	Seq. ID No. 296
151b	Seq. ID No. 297	77145	77163	78218	Seq. ID No. 298
152a	Seq. ID No. 299	78163	78220	78813	Seq. ID No. 300
152b	Seq. ID No. 301	78163	78166	78813	Seq. ID No. 302
153a	Seq. ID No. 303	78814	79048	80013	Seq. ID No. 304
153b	Seq. ID No. 305	78814	78973	80013	Seq. ID No. 306
153c	Seq. ID No. 307	78814	78835	80013	Seq. ID No. 308
154	Seq. ID No. 309	80014	80020	80496	Seq. ID No. 310
155a	Seq. ID No. 311	82026	81981	80719	Seq. ID No. 312
155b	Seq. ID No. 313	82026	82014	80719	Seq. ID No. 314
157a	Seq. ID No. 315	82976	82856	82566	Seq. ID No. 316
157b	Seq. ID No. 317	82976	82958	82566	Seq. ID No. 318
158a	Seq. ID No. 319	83433	83400	82972	Seq. ID No. 320
158b	Seq. ID No. 321	83433	83415	82972	Seq. ID No. 322
160a	Seq. ID No. 323	84411	84378	83584	Seq. ID No. 324
160b	Seq. ID No. 325	84411	84408	83584	Seq. ID No. 326
162a	Seq. ID No. 327	85333	84958	84479	Seq. ID No. 328
162b	Seq. ID No. 329	85333	85117	84479	Seq. ID No. 330
162c	Seq. ID No. 331	85333	85276	84479	Seq. ID No. 332
162d	Seq. ID No. 333	85333	85285	84479	Seq. ID No. 334
162e	Seq. ID No. 335	85333	85309	84479	Seq. ID No. 336
163	Seq. ID No. 337	84597	84609	85145	Seq. ID No. 338
164	Seq. ID No. 339	84797	84812	85264	Seq. ID No. 340
165a	Seq. ID No. 341	86252	86144	85266	Seq. ID No. 342
165b	Seq. ID No. 343	86252	86150	85266	Seq. ID No. 344
167	Seq. ID No. 345	86974	86959	86120	Seq. ID No. 346

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
169	Seq. ID No. 347	86178	86193	86720	Seq. ID No. 348
170	Seq. ID No. 349	86757	86790	87047	Seq. ID No. 350
171a	Seq. ID No. 351	87777	87717	87316	Seq. ID No. 352
171b	Seq. ID No. 353	87777	87762	87316	Seq. ID No. 354
172	Seq. ID No. 355	88726	88726	87785	Seq. ID No. 356
173	Seq. ID No. 357	87518	87560	87805	Seq. ID No. 358
174	Seq. ID No. 359	87942	87969	88196	Seq. ID No. 360
175	Seq. ID No. 361	89206	89194	88793	Seq. ID No. 362
176	Seq. ID No. 363	89592	89589	89224	Seq. ID No. 364
177a	Seq. ID No. 365	90825	90801	90136	Seq. ID No. 366
177b	Seq. ID No. 367	90825	90816	90136	Seq. ID No. 368
179a	Seq. ID No. 369	90536	90599	90823	Seq. ID No. 370
179b	Seq. ID No. 371	90536	90596	90823	Seq. ID No. 372
180a	Seq. ID No. 373	92164	91072	90845	Seq. ID No. 374
180b	Seq. ID No. 375	92164	92155	90845	Seq. ID No. 376
183a	Seq. ID No. 377	91563	91608	91928	Seq. ID No. 378
184	Seq. ID No. 379	92612	92597	92160	Seq. ID No. 380
185	Seq. ID No. 381	92821	92821	92630	Seq. ID No. 382
186	Seq. ID No. 383	93331	93328	92825	Seq. ID No. 384
187a	Seq. ID No. 385	92661	92706	93110	Seq. ID No. 386
187b	Seq. ID No. 387	92661	92670	93110	Seq. ID No. 388
188	Seq. ID No. 389	93727	93718	93350	Seq. ID No. 390
189b	Seq. ID No. 391	94349	94319	93780	Seq. ID No. 392
191b	Seq. ID No. 393	93850	93877	94344	Seq. ID No. 394
192a	Seq. ID No. 395	94748	94742	94350	Seq. ID No. 396
192b	Seq. ID No. 397	94748	94748	94350	Seq. ID No. 398
193	Seq. ID No. 399	94912	94912	94739	Seq. ID No. 400
194a	Seq. ID No. 401	94489	94528	94773	Seq. ID No. 402
194b	Seq. ID No. 403	94489	94516	94773	Seq. ID No. 404

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
195	Seq. ID No. 405	95581	95527	94988	Seq. ID No. 406
196	Seq. ID No. 407	94854	94875	95147	Seq. ID No. 408
197a	Seq. ID No. 409	95874	95862	95560	Seq. ID No. 410
197b	Seq. ID No. 411	95874	95871	95560	Seq. ID No. 412
198a	Seq. ID No. 413	96273	96237	95890	Seq. ID No. 414
198b	Seq. ID No. 415	96273	96258	95890	Seq. ID No. 416
200	Seq. ID No. 417	96560	96557	96294	Seq. ID No. 418
201a	Seq. ID No. 419	96178	96340	96564	Seq. ID No. 420
202	Seq. ID No. 421	96786	96786	96592	Seq. ID No. 422
203	Seq. ID No. 423	97210	97207	96776	Seq. ID No. 424
204	Seq. ID No. 425	97870	97867	97211	Seq. ID No. 426
205	Seq. ID No. 427	98245	98227	97871	Seq. ID No. 428
206	Seq. ID No. 429	98536	98524	98249	Seq. ID No. 430
207	Seq. ID No. 431	98031	98031	98282	Seq. ID No. 432
208a	Seq. ID No. 433	99436	99367	98567	Seq. ID No. 434
208b	Seq. ID No. 435	99436	99412	98567	Seq. ID No. 436
210	Seq. ID No. 437	99792	99738	99445	Seq. ID No. 438
211	Seq. ID No. 439	100364	100361	99738	Seq. ID No. 440
213	Seq. ID No. 441	101050	101020	100388	Seq. ID No. 442
215a	Seq. ID No. 443	101510	101444	101058	Seq. ID No. 444
218	Seq. ID No. 445	102897	102885	102442	Seq. ID No. 446
219	Seq. ID No. 447	104259	104244	103060	Seq. ID No. 448
220a	Seq. ID No. 449	106476	106326	104386	Seq. ID No. 450
220b	Seq. ID No. 451	106476	106428	104386	Seq. ID No. 452
220c	Seq. ID No. 453	106476	106476	104386	Seq. ID No. 454
223a	Seq. ID No. 455	105032	105092	105457	Seq. ID No. 456
223b	Seq. ID No. 457	105032	105065	105457	Seq. ID No. 458
226a	Seq. ID No. 459	107077	106960	106580	Seq. ID No. 460
226b	Seq. ID No. 461	107077	107050	106580	Seq. ID No. 462

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
227	Seq. ID No. 463	107524	107506	107096	Seq. ID No. 464
228a	Seq. ID No. 465	111563	111203	107883	Seq. ID No. 466
228b	Seq. ID No. 467	111563	111269	107883	Seq. ID No. 468
228c	Seq. ID No. 469	111563	111461	107883	Seq. ID No. 470
228d	Seq. ID No. 471	111563	111542	107883	Seq. ID No. 472
232a	Seq. ID No. 473	108687	108723	109223	Seq. ID No. 474
232b	Seq. ID No. 475	108687	108690	109223	Seq. ID No. 476
235a	Seq. ID No. 477	110593	110707	111144	Seq. ID No. 478
235b	Seq. ID No. 479	110593	110626	111144	Seq. ID No. 480
236a	Seq. ID No. 481	115224	115071	111643	Seq. ID No. 482
236b	Seq. ID No. 483	115224	115212	111643	Seq. ID No. 484
236c	Seq. ID No. 485	115224	115221	111643	Seq. ID No. 486
239a	Seq. ID No. 487	111971	112139	112507	Seq. ID No. 488
239b	Seq. ID No. 489	111971	112097	112507	Seq. ID No. 490
239c	Seq. ID No. 491	111971	112085	112507	Seq. ID No. 492
240	Seq. ID No. 493	112508	112601	112867	Seq. ID No. 494
241	Seq. ID No. 495	113123	113129	113374	Seq. ID No. 496
245a	Seq. ID No. 497	116934	116292	115537	Seq. ID No. 498
245b	Seq. ID No. 499	116934	116775	115537	Seq. ID No. 500
245c	Seq. ID No. 501	116934	116895	115537	Seq. ID No. 502
246a	Seq. ID No. 503	118257	118056	117070	Seq. ID No. 504
246b	Seq. ID No. 505	118257	118245	117070	Seq. ID No. 506
247	Seq. ID No. 507	117578	117584	118102	Seq. ID No. 508
248a	Seq. ID No. 509	119490	119358	118264	Seq. ID No. 510
248b	Seq. ID No. 511	119490	119478	118264	Seq. ID No. 512
249a	Seq. ID No. 513	121252	121225	119774	Seq. ID No. 514
249b	Seq. ID No. 515	121252	121252	119774	Seq. ID No. 516
251	Seq. ID No. 517	122162	122150	121326	Seq. ID No. 518
253a	Seq. ID No. 519	122435	122387	122163	Seq. ID No. 520

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
253b	Seq. ID No. 521	122435	122432	122163	Seq. ID No. 522
254	Seq. ID No. 523	123069	123045	122416	Seq. ID No. 524
255a	Seq. ID No. 525	124654	123817	123116	Seq. ID No. 526
255b	Seq. ID No. 527	124654	124408	123116	Seq. ID No. 528
255c	Seq. ID No. 529	124654	124639	123116	Seq. ID No. 530
255d	Seq. ID No. 531	124654	124645	123116	Seq. ID No. 532
258	Seq. ID No. 533	125557	125539	124658	Seq. ID No. 534
259a	Seq. ID No. 535	126322	126256	125558	Seq. ID No. 536
259b	Seq. ID No. 537	126322	126292	125558	Seq. ID No. 538
259c	Seq. ID No. 539	126322	126298	125558	Seq. ID No. 540
260	Seq. ID No. 541	126904	126901	126533	Seq. ID No. 542
262	Seq. ID No. 543	127474	127474	126965	Seq. ID No. 544
263a	Seq. ID No. 545	126519	126645	126968	Seq. ID No. 546
263b	Seq. ID No. 547	126519	126603	126968	Seq. ID No. 548
264b	Seq. ID No. 549	126969	127005	127382	Seq. ID No. 550
265	Seq. ID No. 551	128443	128389	127691	Seq. ID No. 552
267b	Seq. ID No. 553	129002	128912	128487	Seq. ID No. 554
267c	Seq. ID No. 555	129002	128996	128487	Seq. ID No. 556
268	Seq. ID No. 557	128485	128500	128733	Seq. ID No. 558
269a	Seq. ID No. 559	129717	129609	129055	Seq. ID No. 560
269b	Seq. ID No. 561	129717	129708	129055	Seq. ID No. 562
271a	Seq. ID No. 563	131163	131118	129856	Seq. ID No. 564
271b	Seq. ID No. 565	131163	131151	129856	Seq. ID No. 566
273a	Seq. ID No. 567	133346	132791	131694	Seq. ID No. 568
273b	Seq. ID No. 569	133346	133343	131694	Seq. ID No. 570
277a	Seq. ID No. 571	135131	134891	134046	Seq. ID No. 572
277b	Seq. ID No. 573	135131	135077	134046	Seq. ID No. 574
277c	Seq. ID No. 575	135131	135119	134046	Seq. ID No. 576
279a	Seq. ID No. 577	135434	135626	135994	Seq. ID No. 578

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
279b	Seq. ID No. 579	135434	135437	135994	Seq. ID No. 580
280a	Seq. ID No. 581	138094	137200	136100	Seq. ID No. 582
280b	Seq. ID No. 583	138094	137593	136100	Seq. ID No. 584
280c	Seq. ID No. 585	138094	137926	136100	Seq. ID No. 586
280d	Seq. ID No. 587	138094	138052	136100	Seq. ID No. 588
282	Seq. ID No. 589	139430	139388	139116	Seq. ID No. 590
283a	Seq. ID No. 591	138704	138719	139567	Seq. ID No. 592
283b	Seq. ID No. 593	138704	138710	139567	Seq. ID No. 594
284a	Seq. ID No. 595	139568	139592	140257	Seq. ID No. 596
284b	Seq. ID No. 597	139568	139574	140257	Seq. ID No. 598
285b	Seq. ID No. 599	141025	141022	140702	Seq. ID No. 600
286a	Seq. ID No. 601	140271	140286	141035	Seq. ID No. 602
286b	Seq. ID No. 603	140271	140277	141035	Seq. ID No. 604
287	Seq. ID No. 605	142180	142153	141284	Seq. ID No. 606
290a	Seq. ID No. 607	142653	142590	142177	Seq. ID No. 608
290b	Seq. ID No. 609	142653	142638	142177	Seq. ID No. 610
293	Seq. ID No. 611	142822	142855	143292	Seq. ID No. 612
294	Seq. ID No. 613	143980	143974	143411	Seq. ID No. 614
296	Seq. ID No. 615	146154	146151	143974	Seq. ID No. 616
297	Seq. ID No. 617	144242	144227	143988	Seq. ID No. 618
300b	Seq. ID No. 619	145417	145420	145899	Seq. ID No. 620
301a	Seq. ID No. 621	147294	147237	146278	Seq. ID No. 622
301b	Seq. ID No. 623	147294	147264	146278	Seq. ID No. 624
304a	Seq. ID No. 625	149441	149135	147252	Seq. ID No. 626
304b	Seq. ID No. 627	149441	149423	147252	Seq. ID No. 628
307	Seq. ID No. 629	149829	149781	149401	Seq. ID No. 630
308	Seq. ID No. 631	150040	150016	149783	Seq. ID No. 632
309	Seq. ID No. 633	149973	149973	150149	Seq. ID No. 634
310	Seq. ID No. 635	151326	151308	150298	Seq. ID No. 636

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
311	Seq. ID No. 637	153222	153168	151447	Seq. ID No. 638
313a	Seq. ID No. 639	153970	153457	153188	Seq. ID No. 640
313b	Seq. ID No. 641	153970	153496	153188	Seq. ID No. 642
313c	Seq. ID No. 643	153970	153952	153188	Seq. ID No. 644
313d	Seq. ID No. 645	153970	153955	153188	Seq. ID No. 646
313e	Seq. ID No. 647	153970	153961	153188	Seq. ID No. 648
315	Seq. ID No. 649	154835	154826	153939	Seq. ID No. 650
316a	Seq. ID No. 651	155263	155209	154826	Seq. ID No. 652
317a	Seq. ID No. 653	155877	155646	155287	Seq. ID No. 654
317b	Seq. ID No. 655	155877	155865	155287	Seq. ID No. 656
318a	Seq. ID No. 657	157499	157280	156426	Seq. ID No. 658
318b	Seq. ID No. 659	157499	157304	156426	Seq. ID No. 660
318c	Seq. ID No. 661	157499	157367	156426	Seq. ID No. 662
318d	Seq. ID No. 663	157499	157451	156426	Seq. ID No. 664
318e	Seq. ID No. 665	157499	157460	156426	Seq. ID No. 666
320	Seq. ID No. 667	156670	156700	156975	Seq. ID No. 668
321	Seq. ID No. 669	158142	158139	157312	Seq. ID No. 670
323a	Seq. ID No. 671	158413	158341	158129	Seq. ID No. 672
323b	Seq. ID No. 673	158413	158395	158129	Seq. ID No. 674
324	Seq. ID No. 675	159203	159200	158373	Seq. ID No. 676
327a	Seq. ID No. 677	159964	159682	159233	Seq. ID No. 678
327b	Seq. ID No. 679	159964	159844	159233	Seq. ID No. 680
327c	Seq. ID No. 681	159964	159937	159233	Seq. ID No. 682
329	Seq. ID No. 683	161034	161034	159934	Seq. ID No. 684
330a	Seq. ID No. 685	161885	162272	163120	Seq. ID No. 686
330b	Seq. ID No. 687	161885	161975	163120	Seq. ID No. 688
330c	Seq. ID No. 689	161885	161888	163120	Seq. ID No. 690
331	Seq. ID No. 691	162945	162951	163187	Seq. ID No. 692
332	Seq. ID No. 693	163441	163441	163238	Seq. ID No. 694



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
333	Seq. ID No. 695	163242	163248	163478	Seq. ID No. 696
334	Seq. ID No. 697	163339	163339	163563	Seq. ID No. 698
335a	Seq. ID No. 699	163139	163193	163786	Seq. ID No. 700
335b	Seq. ID No. 701	163139	163178	163786	Seq. ID No. 702
337	Seq. ID No. 703	163774	163798	164847	Seq. ID No. 704
338a	Seq. ID No. 705	164835	164961	165473	Seq. ID No. 706
338b	Seq. ID No. 707	164835	164952	165473	Seq. ID No. 708
338c	Seq. ID No. 709	164835	164889	165473	Seq. ID No. 710
341a	Seq. ID No. 711	165550	165709	166422	Seq. ID No. 712
341b	Seq. ID No. 713	165550	165550	166422	Seq. ID No. 714
342a	Seq. ID No. 715	167866	166741	166517	Seq. ID No. 716
342b	Seq. ID No. 717	167866	166810	166517	Seq. ID No. 718
342c	Seq. ID No. 719	167866	166951	166517	Seq. ID No. 720
342d	Seq. ID No. 721	167866	167164	166517	Seq. ID No. 722
342e	Seq. ID No. 723	167866	167602	166517	Seq. ID No. 724
342f	Seq. ID No. 725	167866	167791	166517	Seq. ID No. 726
342g	Seq. ID No. 727	167866	167824	166517	Seq. ID No. 728
342h	Seq. ID No. 729	167866	167857	166517	Seq. ID No. 730
344a	Seq. ID No. 731	167906	167942	168580	Seq. ID No. 732
344b	Seq. ID No. 733	167906	167918	168580	Seq. ID No. 734
345	Seq. ID No. 735	169267	169258	168590	Seq. ID No. 736
346a	Seq. ID No. 737	169209	169296	169616	Seq. ID No. 738
346b	Seq. ID No. 739	169209	169212	169616	Seq. ID No. 740
347	Seq. ID No. 741	170242	170227	169742	Seq. ID No. 742
349a	Seq. ID No. 743	170547	170637	170948	Seq. ID No. 744
349b	Seq. ID No. 745	170547	170559	170948	Seq. ID No. 746
349c	Seq. ID No. 747	170547	170550	170948	Seq. ID No. 748
350a	Seq. ID No. 749	171289	171334	172113	Seq. ID No. 750
350b	Seq. ID No. 751	171289	171304	172113	Seq. ID No. 752

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
351	Seq. ID No. 753	172083	172116	172757	Seq. ID No. 754
352a	Seq. ID No. 755	172736	173237	173545	Seq. ID No. 756
352b	Seq. ID No. 757	172736	173222	173545	Seq. ID No. 758
352c	Seq. ID No. 759	172736	172754	173545	Seq. ID No. 760
354a	Seq. ID No. 761	173511	173913	174341	Seq. ID No. 762
354b	Seq. ID No. 763	173511	173565	174341	Seq. ID No. 764
354c	Seq. ID No. 765	173511	173535	174341	Seq. ID No. 766
355	Seq. ID No. 767	174702	174594	174361	Seq. ID No. 768
356a	Seq. ID No. 769	174424	174847	175176	Seq. ID No. 770
356b	Seq. ID No. 771	174424	174610	175176	Seq. ID No. 772
356c	Seq. ID No. 773	174424	174538	175176	Seq. ID No. 774
356d	Seq. ID No. 775	174424	174469	175176	Seq. ID No. 776
358a	Seq. ID No. 777	175629	176586	176951	Seq. ID No. 778
358b	Seq. ID No. 779	175629	175692	176951	Seq. ID No. 780
358c	Seq. ID No. 781	175629	175653	176951	Seq. ID No. 782
362	Seq. ID No. 783	177179	177206	178258	Seq. ID No. 784
365a	Seq. ID No. 785	178795	178840	179430	Seq. ID No. 786
365b	Seq. ID No. 787	178795	178807	179430	Seq. ID No. 788
366b	Seq. ID No. 789	179373	179436	180101	Seq. ID No. 790
366c	Seq. ID No. 791	179373	179427	180101	Seq. ID No. 792
367a	Seq. ID No. 793	181005	180984	180184	Seq. ID No. 794
367b	Seq. ID No. 795	181005	181002	180184	Seq. ID No. 796
371a	Seq. ID No. 797	181201	181216	181662	Seq. ID No. 798
371b	Seq. ID No. 799	181201	181204	181662	Seq. ID No. 800
372a	Seq. ID No. 801	184610	183770	181809	Seq. ID No. 802
372b	Seq. ID No. 803	184610	184463	181809	Seq. ID No. 804
372c	Seq. ID No. 805	184610	184562	181809	Seq. ID No. 806
372d	Seq. ID No. 807	184610	184598	181809	Seq. ID No. 808
374	Seq. ID No. 809	182287	182368	182628	Seq. ID No. 810

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
377a	Seq. ID No. 811	183658	183769	184497	Seq. ID No. 812
377b	Seq. ID No. 813	183658	183682	184497	Seq. ID No. 814
378a	Seq. ID No. 815	185701	185635	184616	Seq. ID No. 816
378b	Seq. ID No. 817	185701	185677	184616	Seq. ID No. 818
382b	Seq. ID No. 819	186504	186492	185782	Seq. ID No. 820
383a	Seq. ID No. 821	188140	188092	187067	Seq. ID No. 822
383b	Seq. ID No. 823	188140	188104	187067	Seq. ID No. 824
384a	Seq. ID No. 825	189536	188333	188085	Seq. ID No. 826
384b	Seq. ID No. 827	189536	189509	188085	Seq. ID No. 828
385a	Seq. ID No. 829	190440	190362	189526	Seq. ID No. 830
385b	Seq. ID No. 831	190440	190434	189526	Seq. ID No. 832
386	Seq. ID No. 833	190535	190535	190431	Seq. ID No. 834
387	Seq. ID No. 835	192036	192021	190792	Seq. ID No. 836
390	Seq. ID No. 837	192805	192781	192056	Seq. ID No. 838
391	Seq. ID No. 839	193828	193816	192968	Seq. ID No. 840
393b	Seq. ID No. 841	193199	193205	193543	Seq. ID No. 842
395a	Seq. ID No. 843	194052	194199	194792	Seq. ID No. 844
395b	Seq. ID No. 845	194052	194088	194792	Seq. ID No. 846
395c	Seq. ID No. 847	194052	194058	194792	Seq. ID No. 848
396	Seq. ID No. 849	194817	194817	195026	Seq. ID No. 850
398	Seq. ID No. 851	195036	195093	195338	Seq. ID No. 852
400a	Seq. ID No. 853	195530	195740	196156	Seq. ID No. 854
400b	Seq. ID No. 855	195530	195551	196156	Seq. ID No. 856
401a	Seq. ID No. 857	197561	197516	196254	Seq. ID No. 858
401b	Seq. ID No. 859	197561	197549	196254	Seq. ID No. 860
403a	Seq. ID No. 861	200060	199496	198111	Seq. ID No. 862
403b	Seq. ID No. 863	200060	199943	198111	Seq. ID No. 864
403c	Seq. ID No. 865	200060	200000	198111	Seq. ID No. 866
403d	Seq. ID No. 867	200060	200003	198111	Seq. ID No. 868

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
406a	Seq. ID No. 869	201691	201646	200384	Seq. ID No. 870
406b	Seq. ID No. 871	201691	201679	200384	Seq. ID No. 872
409a	Seq. ID No. 873	203082	202980	202234	Seq. ID No. 874
409b	Seq. ID No. 875	203082	203079	202234	Seq. ID No. 876
410a	Seq. ID No. 877	205212	205185	203377	Seq. ID No. 878
410b	Seq. ID No. 879	205212	205200	203377	Seq. ID No. 880
410c	Seq. ID No. 881	205212	205209	203377	Seq. ID No. 882
413a	Seq. ID No. 883	206260	205960	205544	Seq. ID No. 884
413b	Seq. ID No. 885	206260	206224	205544	Seq. ID No. 886
416a	Seq. ID No. 887	206529	206499	206266	Seq. ID No. 888
416b	Seq. ID No. 889	206529	206529	206266	Seq. ID No. 890
417	Seq. ID No. 891	206866	206842	206519	Seq. ID No. 892
418a	Seq. ID No. 893	208884	208674	206959	Seq. ID No. 894
418b	Seq. ID No. 895	208884	208827	206959	Seq. ID No. 896
419a	Seq. ID No. 897	210885	210405	209041	Seq. ID No. 898
419b	Seq. ID No. 899	210885	210609	209041	Seq. ID No. 900
419c	Seq. ID No. 901	210885	210864	209041	Seq. ID No. 902
420a	Seq. ID No. 903	209648	209660	209893	Seq. ID No. 904
420b	Seq. ID No. 905	209648	209657	209893	Seq. ID No. 906
421	Seq. ID No. 907	212336	212297	211083	Seq. ID No. 908
422	Seq. ID No. 909	211732	211765	211989	Seq. ID No. 910
424a	Seq. ID No. 911	213555	213390	212911	Seq. ID No. 912
424b	Seq. ID No. 913	213555	213522	212911	Seq. ID No. 914
424c	Seq. ID No. 915	213555	213525	212911	Seq. ID No. 916
426a	Seq. ID No. 917	213625	213637	213936	Seq. ID No. 918
426b	Seq. ID No. 919	213625	213631	213936	Seq. ID No. 920
427a	Seq. ID No. 921	214643	214553	214074	Seq. ID No. 922
427b	Seq. ID No. 923	214643	214589	214074	Seq. ID No. 924
427c	Seq. ID No. 925	214643	214625	214074	Seq. ID No. 926

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
429a	Seq. ID No. 927	215579	215441	214998	Seq. ID No. 928
429b	Seq. ID No. 929	215579	215498	214998	Seq. ID No. 930
429c	Seq. ID No. 931	215579	215540	214998	Seq. ID No. 932
429d	Seq. ID No. 933	215579	215546	214998	Seq. ID No. 934
431	Seq. ID No. 935	216192	216192	215455	Seq. ID No. 936
434	Seq. ID No. 937	215861	215876	216112	Seq. ID No. 938
435	Seq. ID No. 939	217111	217093	216281	Seq. ID No. 940
437b	Seq. ID No. 941	216993	216987	216646	Seq. ID No. 942
437c	Seq. ID No. 943	216993	216993	216646	Seq. ID No. 944
438a	Seq. ID No. 945	218376	218307	217327	Seq. ID No. 946
438b	Seq. ID No. 947	218376	218352	217327	Seq. ID No. 948
438c	Seq. ID No. 949	218376	218376	217327	Seq. ID No. 950
440	Seq. ID No. 951	219614	219608	218307	Seq. ID No. 952
441a	Seq. ID No. 953	221512	221416	219605	Seq. ID No. 954
441b	Seq. ID No. 955	221512	221491	219605	Seq. ID No. 956
443b	Seq. ID No. 957	220467	220509	220775	Seq. ID No. 958
444a	Seq. ID No. 959	222225	222198	221506	Seq. ID No. 960
444b	Seq. ID No. 961	222225	222213	221506	Seq. ID No. 962
445a	Seq. ID No. 963	222816	222783	222292	Seq. ID No. 964
445b	Seq. ID No. 965	222816	222801	222292	Seq. ID No. 966
448	Seq. ID No. 967	223126	223156	224475	Seq. ID No. 968
450a	Seq. ID No. 969	224457	224481	225266	Seq. ID No. 970
450b	Seq. ID No. 971	224457	224469	225266	Seq. ID No. 972
451a	Seq. ID No. 973	226352	226328	226101	Seq. ID No. 974
451b	Seq. ID No. 975	226352	226331	226101	Seq. ID No. 976
452a	Seq. ID No. 977	225232	225328	226530	Seq. ID No. 978
452b	Seq. ID No. 979	225232	225295	226530	Seq. ID No. 980
452c	Seq. ID No. 981	225232	225256	226530	Seq. ID No. 982
452d	Seq. ID No. 983	225232	225247	226530	Seq. ID No. 984

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
452e	Seq. ID No. 985	225232	225232	226530	Seq. ID No. 986
454b	Seq. ID No. 987	227703	227703	227224	Seq. ID No. 988
455a	Seq. ID No. 989	226615	226738	227742	Seq. ID No. 990
455b	Seq. ID No. 991	226615	226693	227742	Seq. ID No. 992
455c	Seq. ID No. 993	226615	226627	227742	Seq. ID No. 994
458a	Seq. ID No. 995	227816	227936	229081	Seq. ID No. 996
458b	Seq. ID No. 997	227816	227840	229081	Seq. ID No. 998
460a	Seq. ID No. 999	229035	229098	229883	Seq. ID No. 1000
460b	Seq. ID No. 1001	229035	229062	229883	Seq. ID No. 1002
460c	Seq. ID No. 1003	229035	229053	229883	Seq. ID No. 1004
462	Seq. ID No. 1005	230230	230239	230679	Seq. ID No. 1006
463a	Seq. ID No. 1007	230696	230720	231208	Seq. ID No. 1008
463b	Seq. ID No. 1009	230696	230711	231208	Seq. ID No. 1010
464a	Seq. ID No. 1011	233073	231831	231601	Seq. ID No. 1012
464b	Seq. ID No. 1013	233073	232560	231601	Seq. ID No. 1014
464c	Seq. ID No. 1015	233073	232890	231601	Seq. ID No. 1016
464d	Seq. ID No. 1017	233073	233052	231601	Seq. ID No. 1018
465b	Seq. ID No. 1019	232439	232433	232119	Seq. ID No. 1020
467a	Seq. ID No. 1021	234505	234430	233069	Seq. ID No. 1022
467b	Seq. ID No. 1023	234505	234472	233069	Seq. ID No. 1024
471a	Seq. ID No. 1025	235904	235874	235617	Seq. ID No. 1026
471b	Seq. ID No. 1027	235904	235898	235617	Seq. ID No. 1028
472a	Seq. ID No. 1029	234562	235432	235953	Seq. ID No. 1030
472b	Seq. ID No. 1031	234562	235294	235953	Seq. ID No. 1032
472c	Seq. ID No. 1033	234562	234958	235953	Seq. ID No. 1034
472d	Seq. ID No. 1035	234562	234805	235953	Seq. ID No. 1036
472e	Seq. ID No. 1037	234562	234796	235953	Seq. ID No. 1038
472f	Seq. ID No. 1039	234562	234574	235953	Seq. ID No. 1040
473	Seq. ID No. 1041	235954	235963	236619	Seq. ID No. 1042

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
474	Seq. ID No. 1043	237869	237851	236748	Seq. ID No. 1044
476	Seq. ID No. 1045	238557	238551	238282	Seq. ID No. 1046
477b	Seq. ID No. 1047	239139	239133	238819	Seq. ID No. 1048
478a	Seq. ID No. 1049	238145	238253	239143	Seq. ID No. 1050
478b	Seq. ID No. 1051	238145	238208	239143	Seq. ID No. 1052
479	Seq. ID No. 1053	239300	239318	239719	Seq. ID No. 1054
480a	Seq. ID No. 1055	241246	241159	239954	Seq. ID No. 1056
480b	Seq. ID No. 1057	241246	241213	239954	Seq. ID No. 1058
481a	Seq. ID No. 1059	242130	242112	241498	Seq. ID No. 1060
481b	Seq. ID No. 1061	242130	242127	241498	Seq. ID No. 1062
482a	Seq. ID No. 1063	242585	242540	242109	Seq. ID No. 1064
482b	Seq. ID No. 1065	242585	242576	242109	Seq. ID No. 1066
483	Seq. ID No. 1067	243003	243000	242668	Seq. ID No. 1068
490	Seq. ID No. 1069	243146	243158	244378	Seq. ID No. 1070
491a	Seq. ID No. 1071	244796	244763	244506	Seq. ID No. 1072
491b	Seq. ID No. 1073	244796	244781	244506	Seq. ID No. 1074
492	Seq. ID No. 1075	245550	245511	244786	Seq. ID No. 1076
494a	Seq. ID No. 1077	245120	245192	245554	Seq. ID No. 1078
495a	Seq. ID No. 1079	247355	247226	245949	Seq. ID No. 1080
495b	Seq. ID No. 1081	247355	247235	245949	Seq. ID No. 1082
495c	Seq. ID No. 1083	247355	247331	245949	Seq. ID No. 1084
498a	Seq. ID No. 1085	247969	247912	247466	Seq. ID No. 1086
498b	Seq. ID No. 1087	247969	247939	247466	Seq. ID No. 1088
499a	Seq. ID No. 1089	249985	249943	247970	Seq. ID No. 1090
499b	Seq. ID No. 1091	249985	249970	247970	Seq. ID No. 1092
500	Seq. ID No. 1093	250457	250439	250203	Seq. ID No. 1094
502b	Seq. ID No. 1095	251041	250951	250475	Seq. ID No. 1096
502c	Seq. ID No. 1097	251041	251026	250475	Seq. ID No. 1098
504	Seq. ID No. 1099	251402	251372	251070	Seq. ID No. 1100

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
505a	Seq. ID No. 1101	254277	254214	251794	Seq. ID No. 1102
505b	Seq. ID No. 1103	254277	254268	251794	Seq. ID No. 1104
507a	Seq. ID No. 1105	252725	252782	253009	Seq. ID No. 1106
507b	Seq. ID No. 1107	252725	252743	253009	Seq. ID No. 1108
509	Seq. ID No. 1109	256252	256246	254297	Seq. ID No. 1110
510	Seq. ID No. 1111	254739	254781	255125	Seq. ID No. 1112
512a	Seq. ID No. 1113	257457	257433	256297	Seq. ID No. 1114
512b	Seq. ID No. 1115	257457	257442	256297	Seq. ID No. 1116
514	Seq. ID No. 1117	257684	257681	257439	Seq. ID No. 1118
515a	Seq. ID No. 1119	259131	258687	257914	Seq. ID No. 1120
515b	Seq. ID No. 1121	259131	258987	257914	Seq. ID No. 1122
515c	Seq. ID No. 1123	259131	259116	257914	Seq. ID No. 1124
518a	Seq. ID No. 1125	260687	260399	259284	Seq. ID No. 1126
518b	Seq. ID No. 1127	260687	260636	259284	Seq. ID No. 1128
518c	Seq. ID No. 1129	260687	260663	259284	Seq. ID No. 1130
521b	Seq. ID No. 1131	260218	260218	259886	Seq. ID No. 1132
523	Seq. ID No. 1133	261324	261393	261749	Seq. ID No. 1134
524a	Seq. ID No. 1135	261758	262406	262645	Seq. ID No. 1136
524b	Seq. ID No. 1137	261758	261779	262645	Seq. ID No. 1138
525	Seq. ID No. 1139	262929	262920	262696	Seq. ID No. 1140
527a	Seq. ID No. 1141	262700	262727	263797	Seq. ID No. 1142
527b	Seq. ID No. 1143	262700	262709	263797	Seq. ID No. 1144
528a	Seq. ID No. 1145	263837	263867	265153	Seq. ID No. 1146
528b	Seq. ID No. 1147	263837	263861	265153	Seq. ID No. 1148
529	Seq. ID No. 1149	266200	266170	265265	Seq. ID No. 1150
530a	Seq. ID No. 1151	265689	265725	266060	Seq. ID No. 1152
530b	Seq. ID No. 1153	265689	265701	266060	Seq. ID No. 1154
533	Seq. ID No. 1155	266675	266675	268132	Seq. ID No. 1156
535	Seq. ID No. 1157	268203	268266	269903	Seq. ID No. 1158



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
536	Seq. ID No. 1159	269936	269951	270898	Seq. ID No. 1160
539b	Seq. ID No. 1161	271377	271527	272060	Seq. ID No. 1162
539c	Seq. ID No. 1163	271377	271392	272060	Seq. ID No. 1164
541a	Seq. ID No. 1165	272061	272481	272726	Seq. ID No. 1166
541b	Seq. ID No. 1167	272061	272301	272726	Seq. ID No. 1168
541c	Seq. ID No. 1169	272061	272100	272726	Seq. ID No. 1170
541d	Seq. ID No. 1171	272061	272073	272726	Seq. ID No. 1172
542	Seq. ID No. 1173	273208	273208	273047	Seq. ID No. 1174
543a	Seq. ID No. 1175	273962	273872	273201	Seq. ID No. 1176
543b	Seq. ID No. 1177	273962	273914	273201	Seq. ID No. 1178
543c	Seq. ID No. 1179	273962	273923	273201	Seq. ID No. 1180
544	Seq. ID No. 1181	275016	275004	273883	Seq. ID No. 1182
545a	Seq. ID No. 1183	276076	275425	275009	Seq. ID No. 1184
545b	Seq. ID No. 1185	276076	275956	275009	Seq. ID No. 1186
545c	Seq. ID No. 1187	276076	276064	275009	Seq. ID No. 1188
546a	Seq. ID No. 1189	277005	276924	276061	Seq. ID No. 1190
546b	Seq. ID No. 1191	277005	276996	276061	Seq. ID No. 1192
546c	Seq. ID No. 1193	277005	277005	276061	Seq. ID No. 1194
547a	Seq. ID No. 1195	277408	277321	277067	Seq. ID No. 1196
547b	Seq. ID No. 1197	277408	277348	277067	Seq. ID No. 1198
548	Seq. ID No. 1199	277734	277737	278195	Seq. ID No. 1200
549b	Seq. ID No. 1201	280434	280410	279952	Seq. ID No. 1202
550a	Seq. ID No. 1203	280361	280289	280002	Seq. ID No. 1204
551	Seq. ID No. 1205	278647	278659	280005	Seq. ID No. 1206
553c	Seq. ID No. 1207	280944	280935	280549	Seq. ID No. 1208
554a	Seq. ID No. 1209	280006	280024	281070	Seq. ID No. 1210
554b	Seq. ID No. 1211	280006	280018	281070	Seq. ID No. 1212
556	Seq. ID No. 1213	282361	282358	282101	Seq. ID No. 1214
557a	Seq. ID No. 1215	281066	281096	282127	Seq. ID No. 1216

**TABLE 2: ALL CLAIMED ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>ORF Start</b>	<b>Protein Start</b>	<b>ORF Stop</b>	<b>Protein SEQ ID Number</b>
557b	Seq. ID No. 1217	281066	281078	282127	Seq. ID No. 1218
560a	Seq. ID No. 1219	282117	282180	283415	Seq. ID No. 1220
560b	Seq. ID No. 1221	282117	282141	283415	Seq. ID No. 1222
561	Seq. ID No. 1223	285333	285315	283717	Seq. ID No. 1224
563	Seq. ID No. 1225	285391	285409	286263	Seq. ID No. 1226
564a	Seq. ID No. 1227	287308	287116	286733	Seq. ID No. 1228
564b	Seq. ID No. 1229	287308	287149	286733	Seq. ID No. 1230
564c	Seq. ID No. 1231	287308	287305	286733	Seq. ID No. 1232
569	Seq. ID No. 1233	287443	287461	288639	Seq. ID No. 1234
570a	Seq. ID No. 1235	290452	289936	288827	Seq. ID No. 1236
570b	Seq. ID No. 1237	290452	290434	288827	Seq. ID No. 1238
571	Seq. ID No. 1239	288840	288888	289115	Seq. ID No. 1240
573	Seq. ID No. 1241	292365	292332	290620	Seq. ID No. 1242
576a	Seq. ID No. 1243	293274	293223	292969	Seq. ID No. 1244
576b	Seq. ID No. 1245	293274	293271	292969	Seq. ID No. 1246
578a	Seq. ID No. 1247	293907	293826	293311	Seq. ID No. 1248
578b	Seq. ID No. 1249	293907	293859	293311	Seq. ID No. 1250
580a	Seq. ID No. 1251	292718	292730	294118	Seq. ID No. 1252
580b	Seq. ID No. 1253	292718	292727	294118	Seq. ID No. 1254
583a	Seq. ID No. 1255	294365	294470	296365	Seq. ID No. 1256
583b	Seq. ID No. 1257	294365	294467	296365	Seq. ID No. 1258
585b	Seq. ID No. 1259	297067	297028	296621	Seq. ID No. 1260
586a	Seq. ID No. 1261	296610	296637	297083	Seq. ID No. 1262
586b	Seq. ID No. 1263	296610	296613	297083	Seq. ID No. 1264
587a	Seq. ID No. 1265	298917	298014	297532	Seq. ID No. 1266
587b	Seq. ID No. 1267	298917	298155	297532	Seq. ID No. 1268
587c	Seq. ID No. 1269	298917	298611	297532	Seq. ID No. 1270
587d	Seq. ID No. 1271	298917	298884	297532	Seq. ID No. 1272
588a	Seq. ID No. 1273	299041	298978	298235	Seq. ID No. 1274

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
588b	Seq. ID No. 1275	299041	299008	298235	Seq. ID No. 1276
589a	Seq. ID No. 1277	298358	298382	298864	Seq. ID No. 1278
589b	Seq. ID No. 1279	298358	298364	298864	Seq. ID No. 1280
590	Seq. ID No. 1281	299156	299141	298887	Seq. ID No. 1282
595a	Seq. ID No. 1283	304140	303912	303337	Seq. ID No. 1284
595b	Seq. ID No. 1285	304140	304134	303337	Seq. ID No. 1286
596a	Seq. ID No. 1287	303419	303536	303781	Seq. ID No. 1288
596b	Seq. ID No. 1289	303419	303440	303781	Seq. ID No. 1290
596c	Seq. ID No. 1291	303419	303434	303781	Seq. ID No. 1292
597	Seq. ID No. 1293	304680	304674	304141	Seq. ID No. 1294
598a	Seq. ID No. 1295	303848	303869	304144	Seq. ID No. 1296
598b	Seq. ID No. 1297	303848	303863	304144	Seq. ID No. 1298
599a	Seq. ID No. 1299	305589	305412	304867	Seq. ID No. 1300
599b	Seq. ID No. 1301	305589	305589	304867	Seq. ID No. 1302
600a	Seq. ID No. 1303	304997	305018	305251	Seq. ID No. 1304
600b	Seq. ID No. 1305	304997	305012	305251	Seq. ID No. 1306
603a	Seq. ID No. 1307	306557	306572	306961	Seq. ID No. 1308
606	Seq. ID No. 1309	309046	309028	308543	Seq. ID No. 1310
607a	Seq. ID No. 1311	307964	308051	308665	Seq. ID No. 1312
607b	Seq. ID No. 1313	307964	307979	308665	Seq. ID No. 1314
609a	Seq. ID No. 1315	299740	299791	309309	Seq. ID No. 1316
609b	Seq. ID No. 1317	299740	299752	309309	Seq. ID No. 1318
610a	Seq. ID No. 1319	310481	310454	310221	Seq. ID No. 1320
610b	Seq. ID No. 1321	310481	310472	310221	Seq. ID No. 1322
611	Seq. ID No. 1323	310255	310258	310515	Seq. ID No. 1324
613a	Seq. ID No. 1325	310512	310941	311675	Seq. ID No. 1326
613b	Seq. ID No. 1327	310512	310749	311675	Seq. ID No. 1328
613c	Seq. ID No. 1329	310512	310584	311675	Seq. ID No. 1330
613d	Seq. ID No. 1331	310512	310512	311675	Seq. ID No. 1332

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
614a	Seq. ID No. 1333	311715	311754	312194	Seq. ID No. 1334
614b	Seq. ID No. 1335	311715	311736	312194	Seq. ID No. 1336
615b	Seq. ID No. 1337	312828	312807	312418	Seq. ID No. 1338
618	Seq. ID No. 1339	312443	312443	313573	Seq. ID No. 1340
619a	Seq. ID No. 1341	314156	314096	313866	Seq. ID No. 1342
619b	Seq. ID No. 1343	314156	314123	313866	Seq. ID No. 1344
620	Seq. ID No. 1345	314583	314571	313969	Seq. ID No. 1346
623	Seq. ID No. 1347	315369	315318	314881	Seq. ID No. 1348
624a	Seq. ID No. 1349	315050	315110	315355	Seq. ID No. 1350
624b	Seq. ID No. 1351	315050	315107	315355	Seq. ID No. 1352
624c	Seq. ID No. 1353	315050	315098	315355	Seq. ID No. 1354
625	Seq. ID No. 1355	315811	315811	315677	Seq. ID No. 1356
626a	Seq. ID No. 1357	315560	315863	316420	Seq. ID No. 1358
626b	Seq. ID No. 1359	315560	315638	316420	Seq. ID No. 1360
626c	Seq. ID No. 1361	315560	315626	316420	Seq. ID No. 1362
631a	Seq. ID No. 1363	316535	317297	319288	Seq. ID No. 1364
631b	Seq. ID No. 1365	316535	316610	319288	Seq. ID No. 1366
631c	Seq. ID No. 1367	316535	316574	319288	Seq. ID No. 1368
631d	Seq. ID No. 1369	316535	316562	319288	Seq. ID No. 1370
632b	Seq. ID No. 1371	319900	319867	319622	Seq. ID No. 1372
633a	Seq. ID No. 1373	319626	319701	320822	Seq. ID No. 1374
633b	Seq. ID No. 1375	319626	319680	320822	Seq. ID No. 1376
633c	Seq. ID No. 1377	319626	319656	320822	Seq. ID No. 1378
634b	Seq. ID No. 1379	320918	320921	321223	Seq. ID No. 1380
636	Seq. ID No. 1381	323400	323388	323161	Seq. ID No. 1382
637a	Seq. ID No. 1383	321686	321737	323404	Seq. ID No. 1384
637b	Seq. ID No. 1385	321686	321731	323404	Seq. ID No. 1386
637c	Seq. ID No. 1387	321686	321695	323404	Seq. ID No. 1388
640	Seq. ID No. 1389	324722	324674	324414	Seq. ID No. 1390

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
641a	Seq. ID No. 1391	323549	323594	324448	Seq. ID No. 1392
641b	Seq. ID No. 1393	323549	323549	324448	Seq. ID No. 1394
643	Seq. ID No. 1395	324439	324460	324894	Seq. ID No. 1396
644a	Seq. ID No. 1397	324791	324902	325087	Seq. ID No. 1398
644b	Seq. ID No. 1399	324791	324830	325087	Seq. ID No. 1400
645	Seq. ID No. 1401	325456	325453	325181	Seq. ID No. 1402
650	Seq. ID No. 1403	325080	325125	326261	Seq. ID No. 1404
652	Seq. ID No. 1405	326348	326354	326716	Seq. ID No. 1406
653a	Seq. ID No. 1407	326913	327024	328373	Seq. ID No. 1408
653b	Seq. ID No. 1409	326913	326943	328373	Seq. ID No. 1410
653c	Seq. ID No. 1411	326913	326925	328373	Seq. ID No. 1412
656	Seq. ID No. 1413	328370	328373	329863	Seq. ID No. 1414
657c	Seq. ID No. 1415	330464	330530	330994	Seq. ID No. 1416
658a	Seq. ID No. 1417	331110	331140	331565	Seq. ID No. 1418
658b	Seq. ID No. 1419	331110	331110	331565	Seq. ID No. 1420
659a	Seq. ID No. 1421	332594	332510	332055	Seq. ID No. 1422
659b	Seq. ID No. 1423	332594	332582	332055	Seq. ID No. 1424
661	Seq. ID No. 1425	331974	332040	332771	Seq. ID No. 1426
663	Seq. ID No. 1427	333202	333205	333858	Seq. ID No. 1428
665	Seq. ID No. 1429	334188	334203	334598	Seq. ID No. 1430
666	Seq. ID No. 1431	334592	334598	334942	Seq. ID No. 1432
670	Seq. ID No. 1433	334988	335009	336517	Seq. ID No. 1434
674a	Seq. ID No. 1435	336652	336691	338523	Seq. ID No. 1436
674b	Seq. ID No. 1437	336652	336652	338523	Seq. ID No. 1438
676	Seq. ID No. 1439	340581	340611	340835	Seq. ID No. 1440
677a	Seq. ID No. 1441	342484	342442	340949	Seq. ID No. 1442
677b	Seq. ID No. 1443	342484	342469	340949	Seq. ID No. 1444
679a	Seq. ID No. 1445	343500	343410	343186	Seq. ID No. 1446
679b	Seq. ID No. 1447	343500	343461	343186	Seq. ID No. 1448

**TABLE 2: ALL CLAIMED ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>ORF Start</b>	<b>Protein Start</b>	<b>ORF Stop</b>	<b>Protein SEQ ID Number</b>
680	Seq. ID No. 1449	342758	342758	343474	Seq. ID No. 1450
681	Seq. ID No. 1451	343432	343540	344313	Seq. ID No. 1452
683a	Seq. ID No. 1453	344288	344393	345187	Seq. ID No. 1454
683b	Seq. ID No. 1455	344288	344294	345187	Seq. ID No. 1456
684	Seq. ID No. 1457	345386	345395	345622	Seq. ID No. 1458
687	Seq. ID No. 1459	345974	345974	347074	Seq. ID No. 1460
688a	Seq. ID No. 1461	347062	347122	347847	Seq. ID No. 1462
688b	Seq. ID No. 1463	347062	347116	347847	Seq. ID No. 1464
690	Seq. ID No. 1465	348033	348051	349016	Seq. ID No. 1466
691a	Seq. ID No. 1467	349813	349777	349262	Seq. ID No. 1468
691b	Seq. ID No. 1469	349813	349807	349262	Seq. ID No. 1470
692	Seq. ID No. 1471	350818	350797	350156	Seq. ID No. 1472
694	Seq. ID No. 1473	351167	351206	351940	Seq. ID No. 1474
696	Seq. ID No. 1475	351998	352013	352717	Seq. ID No. 1476
698	Seq. ID No. 1477	352953	352974	353339	Seq. ID No. 1478
699b	Seq. ID No. 1479	354064	354055	353720	Seq. ID No. 1480
700a	Seq. ID No. 1481	353340	353775	354068	Seq. ID No. 1482
700b	Seq. ID No. 1483	353340	353364	354068	Seq. ID No. 1484
700c	Seq. ID No. 1485	353340	353358	354068	Seq. ID No. 1486
703	Seq. ID No. 1487	354843	354864	356138	Seq. ID No. 1488
705a	Seq. ID No. 1489	356139	356178	357137	Seq. ID No. 1490
705b	Seq. ID No. 1491	356139	356151	357137	Seq. ID No. 1492
707	Seq. ID No. 1493	358618	358600	357662	Seq. ID No. 1494
709	Seq. ID No. 1495	359170	359134	358619	Seq. ID No. 1496
710	Seq. ID No. 1497	359781	359781	359350	Seq. ID No. 1498
712a	Seq. ID No. 1499	360586	360520	359801	Seq. ID No. 1500
712b	Seq. ID No. 1501	360586	360550	359801	Seq. ID No. 1502
715a	Seq. ID No. 1503	360752	360839	361831	Seq. ID No. 1504
715b	Seq. ID No. 1505	360752	360818	361831	Seq. ID No. 1506

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
717	Seq. ID No. 1507	361785	361833	362309	Seq. ID No. 1508
718a	Seq. ID No. 1509	362257	362323	362622	Seq. ID No. 1510
721	Seq. ID No. 1511	363839	363815	363351	Seq. ID No. 1512
722a	Seq. ID No. 1513	362629	363682	364056	Seq. ID No. 1514
722b	Seq. ID No. 1515	362629	363304	364056	Seq. ID No. 1516
722c	Seq. ID No. 1517	362629	362653	364056	Seq. ID No. 1518
724a	Seq. ID No. 1519	364323	364773	366119	Seq. ID No. 1520
724b	Seq. ID No. 1521	364323	364470	366119	Seq. ID No. 1522
724c	Seq. ID No. 1523	364323	364455	366119	Seq. ID No. 1524
724d	Seq. ID No. 1525	364323	364326	366119	Seq. ID No. 1526
726	Seq. ID No. 1527	366101	366155	366637	Seq. ID No. 1528
728a	Seq. ID No. 1529	366642	366774	367577	Seq. ID No. 1530
728b	Seq. ID No. 1531	366642	366654	367577	Seq. ID No. 1532
730a	Seq. ID No. 1533	367564	368092	368385	Seq. ID No. 1534
730b	Seq. ID No. 1535	367564	367888	368385	Seq. ID No. 1536
730c	Seq. ID No. 1537	367564	367723	368385	Seq. ID No. 1538
730d	Seq. ID No. 1539	367564	367564	368385	Seq. ID No. 1540
731b	Seq. ID No. 1541	368400	368415	368798	Seq. ID No. 1542
732	Seq. ID No. 1543	368838	368880	370058	Seq. ID No. 1544
738a	Seq. ID No. 1545	371023	372094	372465	Seq. ID No. 1546
738b	Seq. ID No. 1547	371023	371140	372465	Seq. ID No. 1548
738c	Seq. ID No. 1549	371023	371050	372465	Seq. ID No. 1550
739	Seq. ID No. 1551	373440	373434	373159	Seq. ID No. 1552
740	Seq. ID No. 1553	374954	374927	374634	Seq. ID No. 1554
741a	Seq. ID No. 1555	378064	378016	377489	Seq. ID No. 1556
741b	Seq. ID No. 1557	378064	378058	377489	Seq. ID No. 1558
743a	Seq. ID No. 1559	372934	373003	378591	Seq. ID No. 1560
743b	Seq. ID No. 1561	372934	372937	378591	Seq. ID No. 1562
744	Seq. ID No. 1563	379071	379080	380426	Seq. ID No. 1564

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
745a	Seq. ID No. 1565	380454	380478	381371	Seq. ID No. 1566
745b	Seq. ID No. 1567	380454	380463	381371	Seq. ID No. 1568
746a	Seq. ID No. 1569	381346	381391	382191	Seq. ID No. 1570
746b	Seq. ID No. 1571	381346	381364	382191	Seq. ID No. 1572
747	Seq. ID No. 1573	382184	382196	383323	Seq. ID No. 1574
748a	Seq. ID No. 1575	383287	383437	384072	Seq. ID No. 1576
748b	Seq. ID No. 1577	383287	383326	384072	Seq. ID No. 1578
749	Seq. ID No. 1579	386651	386615	386352	Seq. ID No. 1580
751	Seq. ID No. 1581	384408	384465	390965	Seq. ID No. 1582
754a	Seq. ID No. 1583	391275	392166	392996	Seq. ID No. 1584
754b	Seq. ID No. 1585	391275	391416	392996	Seq. ID No. 1586
754c	Seq. ID No. 1587	391275	391335	392996	Seq. ID No. 1588
754d	Seq. ID No. 1589	391275	391317	392996	Seq. ID No. 1590
756a	Seq. ID No. 1591	393013	393040	394449	Seq. ID No. 1592
756b	Seq. ID No. 1593	393013	393025	394449	Seq. ID No. 1594
758	Seq. ID No. 1595	394517	394532	394849	Seq. ID No. 1596
760	Seq. ID No. 1597	395517	395529	396824	Seq. ID No. 1598
762a	Seq. ID No. 1599	396888	396909	397820	Seq. ID No. 1600
762b	Seq. ID No. 1601	396888	396906	397820	Seq. ID No. 1602
762c	Seq. ID No. 1603	396888	396903	397820	Seq. ID No. 1604
763a	Seq. ID No. 1605	397821	397887	398228	Seq. ID No. 1606
763b	Seq. ID No. 1607	397821	397824	398228	Seq. ID No. 1608
764	Seq. ID No. 1609	398537	398537	398635	Seq. ID No. 1610
766	Seq. ID No. 1611	399089	399101	399967	Seq. ID No. 1612
767	Seq. ID No. 1613	399968	400034	400435	Seq. ID No. 1614
770a	Seq. ID No. 1615	400630	400984	401823	Seq. ID No. 1616
770b	Seq. ID No. 1617	400630	400894	401823	Seq. ID No. 1618
770c	Seq. ID No. 1619	400630	400693	401823	Seq. ID No. 1620
772a	Seq. ID No. 1621	401846	401996	402577	Seq. ID No. 1622



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
772b	Seq. ID No. 1623	401846	401849	402577	Seq. ID No. 1624
774	Seq. ID No. 1625	402606	402699	402929	Seq. ID No. 1626
775	Seq. ID No. 1627	402562	402595	403254	Seq. ID No. 1628
777a	Seq. ID No. 1629	404283	404343	404675	Seq. ID No. 1630
777c	Seq. ID No. 1631	404283	404298	404675	Seq. ID No. 1632
779	Seq. ID No. 1633	404803	404809	405120	Seq. ID No. 1634
780a	Seq. ID No. 1635	404676	404748	405221	Seq. ID No. 1636
780b	Seq. ID No. 1637	404676	404721	405221	Seq. ID No. 1638
782b	Seq. ID No. 1639	406015	405988	405311	Seq. ID No. 1640
785	Seq. ID No. 1641	407774	407762	406443	Seq. ID No. 1642
786b	Seq. ID No. 1643	407221	407152	406865	Seq. ID No. 1644
788a	Seq. ID No. 1645	408557	408227	407775	Seq. ID No. 1646
788b	Seq. ID No. 1647	408557	408557	407775	Seq. ID No. 1648
789a	Seq. ID No. 1649	409361	409145	408558	Seq. ID No. 1650
789b	Seq. ID No. 1651	409361	409259	408558	Seq. ID No. 1652
789c	Seq. ID No. 1653	409361	409337	408558	Seq. ID No. 1654
791	Seq. ID No. 1655	408880	408910	409161	Seq. ID No. 1656
792	Seq. ID No. 1657	410107	410107	409340	Seq. ID No. 1658
794a	Seq. ID No. 1659	411108	411066	410167	Seq. ID No. 1660
794b	Seq. ID No. 1661	411108	411087	410167	Seq. ID No. 1662
794c	Seq. ID No. 1663	411108	411096	410167	Seq. ID No. 1664
794d	Seq. ID No. 1665	411108	411105	410167	Seq. ID No. 1666
795	Seq. ID No. 1667	411252	411252	411422	Seq. ID No. 1668
797	Seq. ID No. 1669	411604	411610	412293	Seq. ID No. 1670
799a	Seq. ID No. 1671	412586	413474	413698	Seq. ID No. 1672
799b	Seq. ID No. 1673	412586	413210	413698	Seq. ID No. 1674
799c	Seq. ID No. 1675	412586	412757	413698	Seq. ID No. 1676
799d	Seq. ID No. 1677	412586	412721	413698	Seq. ID No. 1678
799e	Seq. ID No. 1679	412586	412667	413698	Seq. ID No. 1680

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
799f	Seq. ID No. 1681	412586	412664	413698	Seq. ID No. 1682
803a	Seq. ID No. 1683	413755	413779	415128	Seq. ID No. 1684
803b	Seq. ID No. 1685	413755	413758	415128	Seq. ID No. 1686
804a	Seq. ID No. 1687	415466	415487	416794	Seq. ID No. 1688
804b	Seq. ID No. 1689	415466	415478	416794	Seq. ID No. 1690
807	Seq. ID No. 1691	416862	417024	418199	Seq. ID No. 1692
808	Seq. ID No. 1693	418549	418555	418794	Seq. ID No. 1694
809b	Seq. ID No. 1695	419662	419632	419243	Seq. ID No. 1696
812	Seq. ID No. 1697	418200	418200	421274	Seq. ID No. 1698
813	Seq. ID No. 1699	421399	421414	422034	Seq. ID No. 1700
816	Seq. ID No. 1701	422122	422122	422283	Seq. ID No. 1702
820a	Seq. ID No. 1703	424733	424739	424969	Seq. ID No. 1704
820b	Seq. ID No. 1705	424733	424733	424969	Seq. ID No. 1706
826	Seq. ID No. 1707	422827	422842	428625	Seq. ID No. 1708
829a	Seq. ID No. 1709	429410	429518	430123	Seq. ID No. 1710
829b	Seq. ID No. 1711	429410	429416	430123	Seq. ID No. 1712
830	Seq. ID No. 1713	431650	431614	430421	Seq. ID No. 1714
834a	Seq. ID No. 1715	431939	432029	432535	Seq. ID No. 1716
834b	Seq. ID No. 1717	431939	431993	432535	Seq. ID No. 1718
834c	Seq. ID No. 1719	431939	431972	432535	Seq. ID No. 1720
835a	Seq. ID No. 1721	432638	432680	433231	Seq. ID No. 1722
835b	Seq. ID No. 1723	432638	432644	433231	Seq. ID No. 1724
836a	Seq. ID No. 1725	434079	434013	433579	Seq. ID No. 1726
836b	Seq. ID No. 1727	434079	434034	433579	Seq. ID No. 1728
836c	Seq. ID No. 1729	434079	434070	433579	Seq. ID No. 1730
837a	Seq. ID No. 1731	434505	435360	435590	Seq. ID No. 1732
837b	Seq. ID No. 1733	434505	434817	435590	Seq. ID No. 1734
837c	Seq. ID No. 1735	434505	434505	435590	Seq. ID No. 1736
843	Seq. ID No. 1737	435813	435840	436859	Seq. ID No. 1738

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
847a	Seq. ID No. 1739	436831	437089	439215	Seq. ID No. 1740
847b	Seq. ID No. 1741	436831	437068	439215	Seq. ID No. 1742
848	Seq. ID No. 1743	439411	439411	439268	Seq. ID No. 1744
849a	Seq. ID No. 1745	440732	440618	439470	Seq. ID No. 1746
849b	Seq. ID No. 1747	440732	440684	439470	Seq. ID No. 1748
851a	Seq. ID No. 1749	440982	441087	442634	Seq. ID No. 1750
851b	Seq. ID No. 1751	440982	441072	442634	Seq. ID No. 1752
853a	Seq. ID No. 1753	442726	442870	443319	Seq. ID No. 1754
853b	Seq. ID No. 1755	442726	442753	443319	Seq. ID No. 1756
853c	Seq. ID No. 1757	442726	442741	443319	Seq. ID No. 1758
854	Seq. ID No. 1759	444233	444233	444006	Seq. ID No. 1760
855	Seq. ID No. 1761	443652	443679	444119	Seq. ID No. 1762
857	Seq. ID No. 1763	446274	446247	445903	Seq. ID No. 1764
859a	Seq. ID No. 1765	444185	445520	446704	Seq. ID No. 1766
859b	Seq. ID No. 1767	444185	444869	446704	Seq. ID No. 1768
859c	Seq. ID No. 1769	444185	444221	446704	Seq. ID No. 1770
859d	Seq. ID No. 1771	444185	444212	446704	Seq. ID No. 1772
860	Seq. ID No. 1773	446857	446887	447093	Seq. ID No. 1774
862	Seq. ID No. 1775	447165	447171	447398	Seq. ID No. 1776
863	Seq. ID No. 1777	447152	447161	448180	Seq. ID No. 1778
864a	Seq. ID No. 1779	449021	448991	448518	Seq. ID No. 1780
864b	Seq. ID No. 1781	449021	449003	448518	Seq. ID No. 1782
866a	Seq. ID No. 1783	448612	448801	449868	Seq. ID No. 1784
866b	Seq. ID No. 1785	448612	448612	449868	Seq. ID No. 1786
868a	Seq. ID No. 1787	449855	450269	450718	Seq. ID No. 1788
868b	Seq. ID No. 1789	449855	449861	450718	Seq. ID No. 1790
870	Seq. ID No. 1791	450768	450792	451754	Seq. ID No. 1792
873a	Seq. ID No. 1793	451842	452103	452924	Seq. ID No. 1794
873b	Seq. ID No. 1795	451842	451920	452924	Seq. ID No. 1796

TABLE 2: ALL CLAIMED ORFS

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
873c	Seq. ID No. 1797	451842	451866	452924	Seq. ID No. 1798
874a	Seq. ID No. 1799	453019	453136	453336	Seq. ID No. 1800
874b	Seq. ID No. 1801	453019	453043	453336	Seq. ID No. 1802
875	Seq. ID No. 1803	453388	453415	453651	Seq. ID No. 1804
876	Seq. ID No. 1805	453874	453898	454509	Seq. ID No. 1806
878a	Seq. ID No. 1807	454510	454738	455313	Seq. ID No. 1808
878b	Seq. ID No. 1809	454510	454588	455313	Seq. ID No. 1810
878c	Seq. ID No. 1811	454510	454549	455313	Seq. ID No. 1812
880a	Seq. ID No. 1813	455379	455454	456086	Seq. ID No. 1814
880b	Seq. ID No. 1815	455379	455406	456086	Seq. ID No. 1816
880c	Seq. ID No. 1817	455379	455397	456086	Seq. ID No. 1818
885	Seq. ID No. 1819	456297	456309	457472	Seq. ID No. 1820
886	Seq. ID No. 1821	457408	457453	458769	Seq. ID No. 1822
887	Seq. ID No. 1823	459402	459396	459118	Seq. ID No. 1824
888	Seq. ID No. 1825	459077	459080	460357	Seq. ID No. 1826
890a	Seq. ID No. 1827	460448	460523	461002	Seq. ID No. 1828
890b	Seq. ID No. 1829	460448	460475	461002	Seq. ID No. 1830
894	Seq. ID No. 1831	463346	463346	463140	Seq. ID No. 1832
904	Seq. ID No. 1833	468103	468097	467843	Seq. ID No. 1834
907a	Seq. ID No. 1835	470121	470022	469240	Seq. ID No. 1836
907b	Seq. ID No. 1837	470121	470103	469240	Seq. ID No. 1838
908a	Seq. ID No. 1839	471898	471376	470636	Seq. ID No. 1840
908b	Seq. ID No. 1841	471898	471886	470636	Seq. ID No. 1842
908c	Seq. ID No. 1843	471898	471895	470636	Seq. ID No. 1844
911	Seq. ID No. 1845	472251	472314	472943	Seq. ID No. 1846
912	Seq. ID No. 1847	472944	472953	473780	Seq. ID No. 1848
916	Seq. ID No. 1849	473774	473798	476413	Seq. ID No. 1850
917	Seq. ID No. 1851	476720	476726	476983	Seq. ID No. 1852
918b	Seq. ID No. 1853	476974	477043	477636	Seq. ID No. 1854

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
918c	Seq. ID No. 1855	476974	476986	477636	Seq. ID No. 1856
919	Seq. ID No. 1857	477670	477709	478032	Seq. ID No. 1858
923	Seq. ID No. 1859	477585	477636	479852	Seq. ID No. 1860
925a	Seq. ID No. 1861	479863	480316	481326	Seq. ID No. 1862
925b	Seq. ID No. 1863	479863	479887	481326	Seq. ID No. 1864
926	Seq. ID No. 1865	481268	481319	482335	Seq. ID No. 1866
927	Seq. ID No. 1867	482317	482347	482928	Seq. ID No. 1868
929a	Seq. ID No. 1869	482918	484175	484519	Seq. ID No. 1870
929b	Seq. ID No. 1871	482918	482918	484519	Seq. ID No. 1872
930	Seq. ID No. 1873	484543	484543	485790	Seq. ID No. 1874
931	Seq. ID No. 1875	486281	486221	485898	Seq. ID No. 1876
932	Seq. ID No. 1877	485791	485809	486294	Seq. ID No. 1878
934a	Seq. ID No. 1879	486257	486377	487435	Seq. ID No. 1880
934b	Seq. ID No. 1881	486257	486353	487435	Seq. ID No. 1882
934c	Seq. ID No. 1883	486257	486278	487435	Seq. ID No. 1884
934d	Seq. ID No. 1885	486257	486269	487435	Seq. ID No. 1886
935	Seq. ID No. 1887	487436	487463	488152	Seq. ID No. 1888
938	Seq. ID No. 1889	488336	488399	489727	Seq. ID No. 1890
939a	Seq. ID No. 1891	491177	490841	489834	Seq. ID No. 1892
939b	Seq. ID No. 1893	491177	490982	489834	Seq. ID No. 1894
939c	Seq. ID No. 1895	491177	491162	489834	Seq. ID No. 1896
942	Seq. ID No. 1897	492089	492065	491685	Seq. ID No. 1898
943	Seq. ID No. 1899	492484	492466	492164	Seq. ID No. 1900
944a	Seq. ID No. 1901	493707	493518	492457	Seq. ID No. 1902
944b	Seq. ID No. 1903	493707	493593	492457	Seq. ID No. 1904
946	Seq. ID No. 1905	493834	493834	494376	Seq. ID No. 1906
949a	Seq. ID No. 1907	494411	494837	495802	Seq. ID No. 1908
949b	Seq. ID No. 1909	494411	494537	495802	Seq. ID No. 1910
949c	Seq. ID No. 1911	494411	494498	495802	Seq. ID No. 1912

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
949d	Seq. ID No. 1913	494411	494435	495802	Seq. ID No. 1914
950	Seq. ID No. 1915	496174	496171	495929	Seq. ID No. 1916
951a	Seq. ID No. 1917	495906	495984	496895	Seq. ID No. 1918
951b	Seq. ID No. 1919	495906	495915	496895	Seq. ID No. 1920
952a	Seq. ID No. 1921	497115	497547	498344	Seq. ID No. 1922
952b	Seq. ID No. 1923	497115	497211	498344	Seq. ID No. 1924
954	Seq. ID No. 1925	498503	498518	499984	Seq. ID No. 1926
955a	Seq. ID No. 1927	500596	500569	500297	Seq. ID No. 1928
955b	Seq. ID No. 1929	500596	500575	500297	Seq. ID No. 1930
956	Seq. ID No. 1931	500019	500019	501308	Seq. ID No. 1932
958a	Seq. ID No. 1933	501309	501417	501866	Seq. ID No. 1934
958b	Seq. ID No. 1935	501309	501309	501866	Seq. ID No. 1936
959	Seq. ID No. 1937	501978	501993	502364	Seq. ID No. 1938
961a	Seq. ID No. 1939	502392	502446	502943	Seq. ID No. 1940
961b	Seq. ID No. 1941	502392	502425	502943	Seq. ID No. 1942
961c	Seq. ID No. 1943	502392	502413	502943	Seq. ID No. 1944
963	Seq. ID No. 1945	502951	502978	503949	Seq. ID No. 1946
965a	Seq. ID No. 1947	503950	503974	504930	Seq. ID No. 1948
965b	Seq. ID No. 1949	503950	503965	504930	Seq. ID No. 1950
966a	Seq. ID No. 1951	504879	504990	506417	Seq. ID No. 1952
966b	Seq. ID No. 1953	504879	504975	506417	Seq. ID No. 1954
967a	Seq. ID No. 1955	506365	506407	506805	Seq. ID No. 1956
967b	Seq. ID No. 1957	506365	506377	506805	Seq. ID No. 1958
968	Seq. ID No. 1959	507166	507184	507951	Seq. ID No. 1960
969	Seq. ID No. 1961	510913	510913	508775	Seq. ID No. 1962
972a	Seq. ID No. 1963	512618	512444	511044	Seq. ID No. 1964
972b	Seq. ID No. 1965	512618	512603	511044	Seq. ID No. 1966
976	Seq. ID No. 1967	512815	512863	514659	Seq. ID No. 1968
977a	Seq. ID No. 1969	515753	515654	514809	Seq. ID No. 1970

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
977b	Seq. ID No. 1971	515753	515738	514809	Seq. ID No. 1972
978a	Seq. ID No. 1973	516892	516718	516326	Seq. ID No. 1974
978b	Seq. ID No. 1975	516892	516856	516326	Seq. ID No. 1976
979	Seq. ID No. 1977	517178	517178	517002	Seq. ID No. 1978
980	Seq. ID No. 1979	518090	518063	517239	Seq. ID No. 1980
981a	Seq. ID No. 1981	517537	517717	517962	Seq. ID No. 1982
982	Seq. ID No. 1983	519084	519033	518146	Seq. ID No. 1984
984a	Seq. ID No. 1985	519141	519309	519995	Seq. ID No. 1986
984b	Seq. ID No. 1987	519141	519216	519995	Seq. ID No. 1988
986	Seq. ID No. 1989	520057	520066	521073	Seq. ID No. 1990
987	Seq. ID No. 1991	521626	521614	521147	Seq. ID No. 1992
988a	Seq. ID No. 1993	522445	522070	521627	Seq. ID No. 1994
988b	Seq. ID No. 1995	522445	522328	521627	Seq. ID No. 1996
988c	Seq. ID No. 1997	522445	522391	521627	Seq. ID No. 1998
988d	Seq. ID No. 1999	522445	522433	521627	Seq. ID No. 2000
991	Seq. ID No. 2001	522779	522782	523339	Seq. ID No. 2002
992	Seq. ID No. 2003	524472	524454	523420	Seq. ID No. 2004
993	Seq. ID No. 2005	523372	523387	524031	Seq. ID No. 2006
994	Seq. ID No. 2007	523709	523763	524269	Seq. ID No. 2008
995	Seq. ID No. 2009	524843	524789	524508	Seq. ID No. 2010
997	Seq. ID No. 2011	525316	525151	525044	Seq. ID No. 2012
998a	Seq. ID No. 2013	524933	524999	525658	Seq. ID No. 2014
998b	Seq. ID No. 2015	524933	524939	525658	Seq. ID No. 2016
999a	Seq. ID No. 2017	526067	526016	525789	Seq. ID No. 2018
999b	Seq. ID No. 2019	526067	526058	525789	Seq. ID No. 2020
1000	Seq. ID No. 2021	526066	526141	526833	Seq. ID No. 2022
1001	Seq. ID No. 2023	526853	526853	527035	Seq. ID No. 2024
1003a	Seq. ID No. 2025	529482	529476	529228	Seq. ID No. 2026
1003b	Seq. ID No. 2027	529482	529482	529228	Seq. ID No. 2028

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1004a	Seq. ID No. 2029	527320	527350	529245	Seq. ID No. 2030
1004b	Seq. ID No. 2031	527320	527335	529245	Seq. ID No. 2032
1006a	Seq. ID No. 2033	529232	529352	530305	Seq. ID No. 2034
1006b	Seq. ID No. 2035	529232	529289	530305	Seq. ID No. 2036
1007	Seq. ID No. 2037	531623	531593	530370	Seq. ID No. 2038
1012	Seq. ID No. 2039	531856	531856	531972	Seq. ID No. 2040
1013a	Seq. ID No. 2041	532239	532698	533411	Seq. ID No. 2042
1013b	Seq. ID No. 2043	532239	532467	533411	Seq. ID No. 2044
1013c	Seq. ID No. 2045	532239	532359	533411	Seq. ID No. 2046
1016c	Seq. ID No. 2047	533402	533432	534148	Seq. ID No. 2048
1017a	Seq. ID No. 2049	534103	534754	535266	Seq. ID No. 2050
1017b	Seq. ID No. 2051	534103	534274	535266	Seq. ID No. 2052
1017c	Seq. ID No. 2053	534103	534187	535266	Seq. ID No. 2054
1017d	Seq. ID No. 2055	534103	534145	535266	Seq. ID No. 2056
1018a	Seq. ID No. 2057	535957	535981	536787	Seq. ID No. 2058
1018b	Seq. ID No. 2059	535957	535978	536787	Seq. ID No. 2060
1021a	Seq. ID No. 2061	536726	536804	537688	Seq. ID No. 2062
1021b	Seq. ID No. 2063	536726	536750	537688	Seq. ID No. 2064
1021c	Seq. ID No. 2065	536726	536729	537688	Seq. ID No. 2066
1024	Seq. ID No. 2067	537700	537700	538749	Seq. ID No. 2068
1025	Seq. ID No. 2069	538763	538772	539779	Seq. ID No. 2070
1026	Seq. ID No. 2071	541222	541222	539954	Seq. ID No. 2072
1029	Seq. ID No. 2073	541559	541619	542479	Seq. ID No. 2074
1033a	Seq. ID No. 2075	542702	542966	544783	Seq. ID No. 2076
1033b	Seq. ID No. 2077	542702	542825	544783	Seq. ID No. 2078
1033c	Seq. ID No. 2079	542702	542741	544783	Seq. ID No. 2080
1035a	Seq. ID No. 2081	546793	546721	546416	Seq. ID No. 2082
1035b	Seq. ID No. 2083	546793	546724	546416	Seq. ID No. 2084
1035c	Seq. ID No. 2085	546793	546739	546416	Seq. ID No. 2086



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1036a	Seq. ID No. 2087	544924	545824	546423	Seq. ID No. 2088
1036b	Seq. ID No. 2089	544924	544978	546423	Seq. ID No. 2090
1036c	Seq. ID No. 2091	544924	544927	546423	Seq. ID No. 2092
1037	Seq. ID No. 2093	546420	546423	547151	Seq. ID No. 2094
1039a	Seq. ID No. 2095	547314	547344	548114	Seq. ID No. 2096
1039b	Seq. ID No. 2097	547314	547317	548114	Seq. ID No. 2098
1041	Seq. ID No. 2099	548111	548132	548725	Seq. ID No. 2100
1042a	Seq. ID No. 2101	548729	548750	549646	Seq. ID No. 2102
1042b	Seq. ID No. 2103	548729	548729	549646	Seq. ID No. 2104
1044a	Seq. ID No. 2105	551333	551243	550767	Seq. ID No. 2106
1044b	Seq. ID No. 2107	551333	551306	550767	Seq. ID No. 2108
1044c	Seq. ID No. 2109	551333	551312	550767	Seq. ID No. 2110
1044d	Seq. ID No. 2111	551333	551324	550767	Seq. ID No. 2112
1047a	Seq. ID No. 2113	550332	550395	552098	Seq. ID No. 2114
1047b	Seq. ID No. 2115	550332	550374	552098	Seq. ID No. 2116
1049a	Seq. ID No. 2117	552053	552182	552889	Seq. ID No. 2118
1049b	Seq. ID No. 2119	552053	552110	552889	Seq. ID No. 2120
1050a	Seq. ID No. 2121	552811	553336	553635	Seq. ID No. 2122
1050b	Seq. ID No. 2123	552811	552859	553635	Seq. ID No. 2124
1050c	Seq. ID No. 2125	552811	552841	553635	Seq. ID No. 2126
1050d	Seq. ID No. 2127	552811	552835	553635	Seq. ID No. 2128
1055	Seq. ID No. 2129	557181	557130	556642	Seq. ID No. 2130
1056a	Seq. ID No. 2131	556313	556367	556645	Seq. ID No. 2132
1056b	Seq. ID No. 2133	556313	556364	556645	Seq. ID No. 2134
1057	Seq. ID No. 2135	553741	553774	557208	Seq. ID No. 2136
1058	Seq. ID No. 2137	557389	557389	558231	Seq. ID No. 2138
1060a	Seq. ID No. 2139	558338	558434	559720	Seq. ID No. 2140
1060b	Seq. ID No. 2141	558338	558353	559720	Seq. ID No. 2142
1062	Seq. ID No. 2143	559708	559717	560406	Seq. ID No. 2144

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1063	Seq. ID No. 2145	560912	560888	560631	Seq. ID No. 2146
1064	Seq. ID No. 2147	560346	560415	560714	Seq. ID No. 2148
1065a	Seq. ID No. 2149	560743	560857	561312	Seq. ID No. 2150
1065b	Seq. ID No. 2151	560743	560824	561312	Seq. ID No. 2152
1065c	Seq. ID No. 2153	560743	560791	561312	Seq. ID No. 2154
1066a	Seq. ID No. 2155	561721	561637	561359	Seq. ID No. 2156
1066b	Seq. ID No. 2157	561721	561715	561359	Seq. ID No. 2158
1067	Seq. ID No. 2159	561384	561417	562028	Seq. ID No. 2160
1069	Seq. ID No. 2161	562186	562186	562629	Seq. ID No. 2162
1070a	Seq. ID No. 2163	562626	562911	563282	Seq. ID No. 2164
1070b	Seq. ID No. 2165	562626	562635	563282	Seq. ID No. 2166
1076a	Seq. ID No. 2167	563437	563620	566925	Seq. ID No. 2168
1076b	Seq. ID No. 2169	563437	563443	566925	Seq. ID No. 2170
1077a	Seq. ID No. 2171	566894	568136	568525	Seq. ID No. 2172
1077b	Seq. ID No. 2173	566894	567506	568525	Seq. ID No. 2174
1077c	Seq. ID No. 2175	566894	567296	568525	Seq. ID No. 2176
1077d	Seq. ID No. 2177	566894	567170	568525	Seq. ID No. 2178
1077e	Seq. ID No. 2179	566894	566918	568525	Seq. ID No. 2180
1079a	Seq. ID No. 2181	568458	568518	569591	Seq. ID No. 2182
1079b	Seq. ID No. 2183	568458	568485	569591	Seq. ID No. 2184
1080a	Seq. ID No. 2185	569461	569575	569865	Seq. ID No. 2186
1081a	Seq. ID No. 2187	570009	570099	570491	Seq. ID No. 2188
1081b	Seq. ID No. 2189	570009	570021	570491	Seq. ID No. 2190
1082	Seq. ID No. 2191	570545	570560	571390	Seq. ID No. 2192
1085	Seq. ID No. 2193	571448	571493	571930	Seq. ID No. 2194
1086	Seq. ID No. 2195	572006	572021	573433	Seq. ID No. 2196
1087a	Seq. ID No. 2197	573393	573438	573983	Seq. ID No. 2198
1087b	Seq. ID No. 2199	573393	573402	573983	Seq. ID No. 2200
1091a	Seq. ID No. 2201	574840	574903	575133	Seq. ID No. 2202

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1091b	Seq. ID No. 2203	574840	574888	575133	Seq. ID No. 2204
1094a	Seq. ID No. 2205	574083	574122	576380	Seq. ID No. 2206
1094b	Seq. ID No. 2207	574083	574110	576380	Seq. ID No. 2208
1095a	Seq. ID No. 2209	575929	575968	576420	Seq. ID No. 2210
1095b	Seq. ID No. 2211	575929	575950	576420	Seq. ID No. 2212
1096a	Seq. ID No. 2213	576567	576657	577469	Seq. ID No. 2214
1096b	Seq. ID No. 2215	576567	576597	577469	Seq. ID No. 2216
1096c	Seq. ID No. 2217	576567	576585	577469	Seq. ID No. 2218
1097	Seq. ID No. 2219	577758	577839	578270	Seq. ID No. 2220
1098b	Seq. ID No. 2221	578304	578304	578753	Seq. ID No. 2222
1100	Seq. ID No. 2223	578719	578740	579318	Seq. ID No. 2224
1101a	Seq. ID No. 2225	579319	579388	579663	Seq. ID No. 2226
1101b	Seq. ID No. 2227	579319	579325	579663	Seq. ID No. 2228
1104	Seq. ID No. 2229	579892	579925	580959	Seq. ID No. 2230
1106	Seq. ID No. 2231	581018	581033	581344	Seq. ID No. 2232
1108a	Seq. ID No. 2233	581194	581413	582546	Seq. ID No. 2234
1108b	Seq. ID No. 2235	581194	581254	582546	Seq. ID No. 2236
1111a	Seq. ID No. 2237	582575	582815	583843	Seq. ID No. 2238
1111b	Seq. ID No. 2239	582575	582611	583843	Seq. ID No. 2240
1111c	Seq. ID No. 2241	582575	582578	583843	Seq. ID No. 2242
1112a	Seq. ID No. 2243	584607	584424	584239	Seq. ID No. 2244
1125	Seq. ID No. 2245	590309	590312	590752	Seq. ID No. 2246
1126a	Seq. ID No. 2247	590674	590830	591966	Seq. ID No. 2248
1126b	Seq. ID No. 2249	590674	590749	591966	Seq. ID No. 2250
1126c	Seq. ID No. 2251	590674	590734	591966	Seq. ID No. 2252
1127	Seq. ID No. 2253	591927	591963	592610	Seq. ID No. 2254
1128	Seq. ID No. 2255	592612	592612	592767	Seq. ID No. 2256
1131	Seq. ID No. 2257	593102	593108	594118	Seq. ID No. 2258
1132	Seq. ID No. 2259	594208	594211	595179	Seq. ID No. 2260

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1135a	Seq. ID No. 2261	595339	595396	596805	Seq. ID No. 2262
1135b	Seq. ID No. 2263	595339	595381	596805	Seq. ID No. 2264
1136a	Seq. ID No. 2265	598288	598243	596903	Seq. ID No. 2266
1136b	Seq. ID No. 2267	598288	598267	596903	Seq. ID No. 2268
1138	Seq. ID No. 2269	599921	599849	598668	Seq. ID No. 2270
1140a	Seq. ID No. 2271	602187	601377	600247	Seq. ID No. 2272
1140b	Seq. ID No. 2273	602187	601914	600247	Seq. ID No. 2274
1140c	Seq. ID No. 2275	602187	602187	600247	Seq. ID No. 2276
1141a	Seq. ID No. 2277	600251	600302	600556	Seq. ID No. 2278
1141b	Seq. ID No. 2279	600251	600257	600556	Seq. ID No. 2280
1142	Seq. ID No. 2281	602718	602700	602377	Seq. ID No. 2282
1144a	Seq. ID No. 2283	602866	603421	603672	Seq. ID No. 2284
1144b	Seq. ID No. 2285	602866	602962	603672	Seq. ID No. 2286
1144c	Seq. ID No. 2287	602866	602893	603672	Seq. ID No. 2288
1146a	Seq. ID No. 2289	603660	604296	604598	Seq. ID No. 2290
1146b	Seq. ID No. 2291	603660	604140	604598	Seq. ID No. 2292
1146c	Seq. ID No. 2293	603660	603963	604598	Seq. ID No. 2294
1146d	Seq. ID No. 2295	603660	603828	604598	Seq. ID No. 2296
1146e	Seq. ID No. 2297	603660	603675	604598	Seq. ID No. 2298
1148	Seq. ID No. 2299	604610	604631	605278	Seq. ID No. 2300
1149	Seq. ID No. 2301	607200	607170	605347	Seq. ID No. 2302
1152a	Seq. ID No. 2303	607234	608383	608667	Seq. ID No. 2304
1152b	Seq. ID No. 2305	607234	607984	608667	Seq. ID No. 2306
1152c	Seq. ID No. 2307	607234	607690	608667	Seq. ID No. 2308
1152d	Seq. ID No. 2309	607234	607429	608667	Seq. ID No. 2310
1152e	Seq. ID No. 2311	607234	607297	608667	Seq. ID No. 2312
1152f	Seq. ID No. 2313	607234	607261	608667	Seq. ID No. 2314
1152g	Seq. ID No. 2315	607234	607252	608667	Seq. ID No. 2316
1155a	Seq. ID No. 2317	608668	609631	610128	Seq. ID No. 2318

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1155b	Seq. ID No. 2319	608668	609508	610128	Seq. ID No. 2320
1155c	Seq. ID No. 2321	608668	609319	610128	Seq. ID No. 2322
1155d	Seq. ID No. 2323	608668	609193	610128	Seq. ID No. 2324
1155e	Seq. ID No. 2325	608668	608896	610128	Seq. ID No. 2326
1155f	Seq. ID No. 2327	608668	608683	610128	Seq. ID No. 2328
1155g	Seq. ID No. 2329	608668	608671	610128	Seq. ID No. 2330
1158a	Seq. ID No. 2331	610088	610232	611965	Seq. ID No. 2332
1158b	Seq. ID No. 2333	610088	610091	611965	Seq. ID No. 2334
1160	Seq. ID No. 2335	612095	612125	612553	Seq. ID No. 2336
1161a	Seq. ID No. 2337	612672	612684	612935	Seq. ID No. 2338
1161b	Seq. ID No. 2339	612672	612675	612935	Seq. ID No. 2340
1162	Seq. ID No. 2341	613141	613141	613064	Seq. ID No. 2342
1165	Seq. ID No. 2343	613461	613476	614456	Seq. ID No. 2344
1166	Seq. ID No. 2345	614621	614621	615358	Seq. ID No. 2346
1167a	Seq. ID No. 2347	615351	615507	616433	Seq. ID No. 2348
1167b	Seq. ID No. 2349	615351	615351	616433	Seq. ID No. 2350
1168	Seq. ID No. 2351	616628	616640	617020	Seq. ID No. 2352
1169a	Seq. ID No. 2353	617085	618015	619262	Seq. ID No. 2354
1169b	Seq. ID No. 2355	617085	617751	619262	Seq. ID No. 2356
1169c	Seq. ID No. 2357	617085	617109	619262	Seq. ID No. 2358
1170	Seq. ID No. 2359	619263	619263	619499	Seq. ID No. 2360
1171a	Seq. ID No. 2361	619429	619558	619929	Seq. ID No. 2362
1171c	Seq. ID No. 2363	619429	619501	619929	Seq. ID No. 2364
1172	Seq. ID No. 2365	619930	619930	620520	Seq. ID No. 2366
1173	Seq. ID No. 2367	621124	621133	621411	Seq. ID No. 2368
1174	Seq. ID No. 2369	620736	620745	621947	Seq. ID No. 2370
1175	Seq. ID No. 2371	622379	622379	622125	Seq. ID No. 2372
1177	Seq. ID No. 2373	621934	621958	622941	Seq. ID No. 2374
1178	Seq. ID No. 2375	623806	623752	623462	Seq. ID No. 2376

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1179a	Seq. ID No. 2377	624467	624323	623553	Seq. ID No. 2378
1179b	Seq. ID No. 2379	624467	624440	623553	Seq. ID No. 2380
1179c	Seq. ID No. 2381	624467	624449	623553	Seq. ID No. 2382
1180a	Seq. ID No. 2383	626331	625863	624772	Seq. ID No. 2384
1180b	Seq. ID No. 2385	626331	626118	624772	Seq. ID No. 2386
1180c	Seq. ID No. 2387	626331	626217	624772	Seq. ID No. 2388
1180d	Seq. ID No. 2389	626331	626253	624772	Seq. ID No. 2390
1180e	Seq. ID No. 2391	626331	626310	624772	Seq. ID No. 2392
1182a	Seq. ID No. 2393	626734	626677	626441	Seq. ID No. 2394
1182b	Seq. ID No. 2395	626734	626716	626441	Seq. ID No. 2396
1183a	Seq. ID No. 2397	626391	626460	627632	Seq. ID No. 2398
1183b	Seq. ID No. 2399	626391	626430	627632	Seq. ID No. 2400
1184	Seq. ID No. 2401	629315	629285	627993	Seq. ID No. 2402
1185a	Seq. ID No. 2403	630076	629893	629300	Seq. ID No. 2404
1185b	Seq. ID No. 2405	630076	630007	629300	Seq. ID No. 2406
1186a	Seq. ID No. 2407	630394	630427	631026	Seq. ID No. 2408
1186b	Seq. ID No. 2409	630394	630403	631026	Seq. ID No. 2410
1188a	Seq. ID No. 2411	630986	631292	631714	Seq. ID No. 2412
1188b	Seq. ID No. 2413	630986	631007	631714	Seq. ID No. 2414
1188c	Seq. ID No. 2415	630986	630998	631714	Seq. ID No. 2416
1191	Seq. ID No. 2417	631666	631711	633153	Seq. ID No. 2418
1192a	Seq. ID No. 2419	634110	634047	633199	Seq. ID No. 2420
1192b	Seq. ID No. 2421	634110	634110	633199	Seq. ID No. 2422
1194	Seq. ID No. 2423	634701	634680	634123	Seq. ID No. 2424
1196a	Seq. ID No. 2425	634859	634868	635863	Seq. ID No. 2426
1196b	Seq. ID No. 2427	634859	634859	635863	Seq. ID No. 2428
1197	Seq. ID No. 2429	635887	635887	636759	Seq. ID No. 2430
1198	Seq. ID No. 2431	636665	636668	636898	Seq. ID No. 2432
1199a	Seq. ID No. 2433	636828	636942	637436	Seq. ID No. 2434

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1199b	Seq. ID No. 2435	636828	636888	637436	Seq. ID No. 2436
1200	Seq. ID No. 2437	637555	637555	638352	Seq. ID No. 2438
1201	Seq. ID No. 2439	638346	638373	638648	Seq. ID No. 2440
1202a	Seq. ID No. 2441	638811	638871	639152	Seq. ID No. 2442
1202b	Seq. ID No. 2443	638811	638844	639152	Seq. ID No. 2444
1205	Seq. ID No. 2445	639692	639704	640546	Seq. ID No. 2446
1206	Seq. ID No. 2447	642187	642151	641477	Seq. ID No. 2448
1207	Seq. ID No. 2449	640543	640543	641538	Seq. ID No. 2450
1208	Seq. ID No. 2451	641532	641538	642890	Seq. ID No. 2452
1209	Seq. ID No. 2453	642972	642984	643718	Seq. ID No. 2454
1210a	Seq. ID No. 2455	644513	644420	643800	Seq. ID No. 2456
1210b	Seq. ID No. 2457	644513	644495	643800	Seq. ID No. 2458
1212	Seq. ID No. 2459	646415	646403	646137	Seq. ID No. 2460
1213a	Seq. ID No. 2461	644672	644684	646174	Seq. ID No. 2462
1213b	Seq. ID No. 2463	644672	644681	646174	Seq. ID No. 2464
1214	Seq. ID No. 2465	646171	646171	646944	Seq. ID No. 2466
1215a	Seq. ID No. 2467	646895	647057	647500	Seq. ID No. 2468
1215b	Seq. ID No. 2469	646895	646907	647500	Seq. ID No. 2470
1217c	Seq. ID No. 2471	647452	647515	648060	Seq. ID No. 2472
1218a	Seq. ID No. 2473	648023	648035	649042	Seq. ID No. 2474
1218b	Seq. ID No. 2475	648023	648023	649042	Seq. ID No. 2476
1219	Seq. ID No. 2477	649847	649754	649371	Seq. ID No. 2478
1220	Seq. ID No. 2479	649953	649953	649813	Seq. ID No. 2480
1221a	Seq. ID No. 2481	652043	652016	650058	Seq. ID No. 2482
1221b	Seq. ID No. 2483	652043	652037	650058	Seq. ID No. 2484
1223	Seq. ID No. 2485	652187	652208	652873	Seq. ID No. 2486
1224a	Seq. ID No. 2487	653833	653740	653129	Seq. ID No. 2488
1224b	Seq. ID No. 2489	653833	653791	653129	Seq. ID No. 2490
1224c	Seq. ID No. 2491	653833	653824	653129	Seq. ID No. 2492

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1225	Seq. ID No. 2493	654455	654434	653970	Seq. ID No. 2494
1226	Seq. ID No. 2495	654010	654010	654294	Seq. ID No. 2496
1228a	Seq. ID No. 2497	655583	655400	655020	Seq. ID No. 2498
1228b	Seq. ID No. 2499	655583	655562	655020	Seq. ID No. 2500
1229b	Seq. ID No. 2501	656021	655988	655689	Seq. ID No. 2502
1229c	Seq. ID No. 2503	656021	655994	655689	Seq. ID No. 2504
1230	Seq. ID No. 2505	654334	654337	655968	Seq. ID No. 2506
1231	Seq. ID No. 2507	656741	656720	656064	Seq. ID No. 2508
1233a	Seq. ID No. 2509	656808	656892	657533	Seq. ID No. 2510
1233b	Seq. ID No. 2511	656808	656874	657533	Seq. ID No. 2512
1233c	Seq. ID No. 2513	656808	656871	657533	Seq. ID No. 2514
1234a	Seq. ID No. 2515	657534	657801	658301	Seq. ID No. 2516
1234b	Seq. ID No. 2517	657534	657744	658301	Seq. ID No. 2518
1234c	Seq. ID No. 2519	657534	657537	658301	Seq. ID No. 2520
1235	Seq. ID No. 2521	658795	658795	658484	Seq. ID No. 2522
1236a	Seq. ID No. 2523	659168	659063	658815	Seq. ID No. 2524
1237	Seq. ID No. 2525	658446	658503	659438	Seq. ID No. 2526
1239	Seq. ID No. 2527	659964	659976	660188	Seq. ID No. 2528
1240	Seq. ID No. 2529	661436	661367	660249	Seq. ID No. 2530
1241a	Seq. ID No. 2531	661467	662226	662597	Seq. ID No. 2532
1241b	Seq. ID No. 2533	661467	661497	662597	Seq. ID No. 2534
1241c	Seq. ID No. 2535	661467	661479	662597	Seq. ID No. 2536
1243	Seq. ID No. 2537	662682	662682	663986	Seq. ID No. 2538
1244	Seq. ID No. 2539	664168	664189	664956	Seq. ID No. 2540
1245a	Seq. ID No. 2541	666679	665737	665099	Seq. ID No. 2542
1245b	Seq. ID No. 2543	666679	666304	665099	Seq. ID No. 2544
1245c	Seq. ID No. 2545	666679	666400	665099	Seq. ID No. 2546
1245d	Seq. ID No. 2547	666679	666649	665099	Seq. ID No. 2548
1245e	Seq. ID No. 2549	666679	666658	665099	Seq. ID No. 2550



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1246a	Seq. ID No. 2551	667345	667318	666701	Seq. ID No. 2552
1246b	Seq. ID No. 2553	667345	667327	666701	Seq. ID No. 2554
1250a	Seq. ID No. 2555	667704	668655	668966	Seq. ID No. 2556
1250b	Seq. ID No. 2557	667704	667953	668966	Seq. ID No. 2558
1250c	Seq. ID No. 2559	667704	667830	668966	Seq. ID No. 2560
1250d	Seq. ID No. 2561	667704	667782	668966	Seq. ID No. 2562
1250e	Seq. ID No. 2563	667704	667746	668966	Seq. ID No. 2564
1251a	Seq. ID No. 2565	669339	669444	669770	Seq. ID No. 2566
1251b	Seq. ID No. 2567	669339	669420	669770	Seq. ID No. 2568
1253a	Seq. ID No. 2569	669718	670432	670668	Seq. ID No. 2570
1253b	Seq. ID No. 2571	669718	670354	670668	Seq. ID No. 2572
1253c	Seq. ID No. 2573	669718	669841	670668	Seq. ID No. 2574
1253d	Seq. ID No. 2575	669718	669808	670668	Seq. ID No. 2576
1256	Seq. ID No. 2577	670771	670801	672036	Seq. ID No. 2578
1257a	Seq. ID No. 2579	671964	672051	672518	Seq. ID No. 2580
1257b	Seq. ID No. 2581	671964	672048	672518	Seq. ID No. 2582
1258a	Seq. ID No. 2583	675281	674429	672591	Seq. ID No. 2584
1258b	Seq. ID No. 2585	675281	675200	672591	Seq. ID No. 2586
1258c	Seq. ID No. 2587	675281	675221	672591	Seq. ID No. 2588
1258d	Seq. ID No. 2589	675281	675278	672591	Seq. ID No. 2590
1260	Seq. ID No. 2591	672895	672934	673179	Seq. ID No. 2592
1263	Seq. ID No. 2593	675596	675608	676525	Seq. ID No. 2594
1265	Seq. ID No. 2595	676530	676545	677219	Seq. ID No. 2596
1266a	Seq. ID No. 2597	677365	677401	678045	Seq. ID No. 2598
1266b	Seq. ID No. 2599	677365	677365	678045	Seq. ID No. 2600
1267a	Seq. ID No. 2601	678014	678107	678361	Seq. ID No. 2602
1267b	Seq. ID No. 2603	678014	678038	678361	Seq. ID No. 2604
1268a	Seq. ID No. 2605	680490	680229	678862	Seq. ID No. 2606
1268b	Seq. ID No. 2607	680490	680436	678862	Seq. ID No. 2608

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1269	Seq. ID No. 2609	680591	680612	681463	Seq. ID No. 2610
1270	Seq. ID No. 2611	682595	682535	682245	Seq. ID No. 2612
1271	Seq. ID No. 2613	681643	681646	683115	Seq. ID No. 2614
1272a	Seq. ID No. 2615	684311	684107	683223	Seq. ID No. 2616
1272b	Seq. ID No. 2617	684311	684308	683223	Seq. ID No. 2618
1273	Seq. ID No. 2619	685392	685377	684289	Seq. ID No. 2620
1275a	Seq. ID No. 2621	686415	686145	685393	Seq. ID No. 2622
1275b	Seq. ID No. 2623	686415	686403	685393	Seq. ID No. 2624
1277	Seq. ID No. 2625	687376	687349	686396	Seq. ID No. 2626
1278a	Seq. ID No. 2627	686400	686439	686732	Seq. ID No. 2628
1278b	Seq. ID No. 2629	686400	686406	686732	Seq. ID No. 2630
1279	Seq. ID No. 2631	687461	687506	688435	Seq. ID No. 2632
1281	Seq. ID No. 2633	688554	688557	689963	Seq. ID No. 2634
1283a	Seq. ID No. 2635	690164	690239	691681	Seq. ID No. 2636
1283b	Seq. ID No. 2637	690164	690212	691681	Seq. ID No. 2638
1283c	Seq. ID No. 2639	690164	690182	691681	Seq. ID No. 2640
1284	Seq. ID No. 2641	691675	691681	692520	Seq. ID No. 2642
1285a	Seq. ID No. 2643	692499	692535	693674	Seq. ID No. 2644
1285b	Seq. ID No. 2645	692499	692502	693674	Seq. ID No. 2646
1287a	Seq. ID No. 2647	693675	693741	694412	Seq. ID No. 2648
1287b	Seq. ID No. 2649	693675	693696	694412	Seq. ID No. 2650
1288	Seq. ID No. 2651	696061	696046	695036	Seq. ID No. 2652
1289	Seq. ID No. 2653	695318	695384	695629	Seq. ID No. 2654
1290	Seq. ID No. 2655	696712	696700	696062	Seq. ID No. 2656
1293a	Seq. ID No. 2657	696820	697045	698178	Seq. ID No. 2658
1293b	Seq. ID No. 2659	696820	696829	698178	Seq. ID No. 2660
1294a	Seq. ID No. 2661	698539	698527	698231	Seq. ID No. 2662
1295	Seq. ID No. 2663	698150	698171	698863	Seq. ID No. 2664
1297a	Seq. ID No. 2665	699177	699198	699776	Seq. ID No. 2666

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1297b	Seq. ID No. 2667	699177	699180	699776	Seq. ID No. 2668
1300	Seq. ID No. 2669	699972	699981	702449	Seq. ID No. 2670
1302	Seq. ID No. 2671	702563	702629	703615	Seq. ID No. 2672
1305a	Seq. ID No. 2673	703701	703719	704396	Seq. ID No. 2674
1305b	Seq. ID No. 2675	703701	703710	704396	Seq. ID No. 2676
1305c	Seq. ID No. 2677	703701	703701	704396	Seq. ID No. 2678
1308a	Seq. ID No. 2679	704332	704872	705273	Seq. ID No. 2680
1308b	Seq. ID No. 2681	704332	704452	705273	Seq. ID No. 2682
1308c	Seq. ID No. 2683	704332	704362	705273	Seq. ID No. 2684
1308d	Seq. ID No. 2685	704332	704344	705273	Seq. ID No. 2686
1308e	Seq. ID No. 2687	704332	704332	705273	Seq. ID No. 2688
1311	Seq. ID No. 2689	705580	705598	706314	Seq. ID No. 2690
1314b	Seq. ID No. 2691	707728	707725	707432	Seq. ID No. 2692
1315	Seq. ID No. 2693	706311	706311	708119	Seq. ID No. 2694
1316	Seq. ID No. 2695	708319	708325	708573	Seq. ID No. 2696
1317	Seq. ID No. 2697	709234	709210	708947	Seq. ID No. 2698
1318	Seq. ID No. 2699	708258	708261	709274	Seq. ID No. 2700
1319a	Seq. ID No. 2701	709369	709570	710250	Seq. ID No. 2702
1319b	Seq. ID No. 2703	709369	709390	710250	Seq. ID No. 2704
1320a	Seq. ID No. 2705	710244	710745	711068	Seq. ID No. 2706
1320b	Seq. ID No. 2707	710244	710400	711068	Seq. ID No. 2708
1320c	Seq. ID No. 2709	710244	710250	711068	Seq. ID No. 2710
1321	Seq. ID No. 2711	711047	711068	711586	Seq. ID No. 2712
1322a	Seq. ID No. 2713	711571	711586	711831	Seq. ID No. 2714
1322b	Seq. ID No. 2715	711571	711583	711831	Seq. ID No. 2716
1323b	Seq. ID No. 2717	712308	712248	711997	Seq. ID No. 2718
1324	Seq. ID No. 2719	711914	711917	712600	Seq. ID No. 2720
1326a	Seq. ID No. 2721	712714	712729	713361	Seq. ID No. 2722
1326b	Seq. ID No. 2723	712714	712723	713361	Seq. ID No. 2724

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1326c	Seq. ID No. 2725	712714	712720	713361	Seq. ID No. 2726
1333	Seq. ID No. 2727	713541	713541	716393	Seq. ID No. 2728
1334a	Seq. ID No. 2729	716775	716739	716479	Seq. ID No. 2730
1334b	Seq. ID No. 2731	716775	716748	716479	Seq. ID No. 2732
1335a	Seq. ID No. 2733	717513	717270	716776	Seq. ID No. 2734
1335b	Seq. ID No. 2735	717513	717462	716776	Seq. ID No. 2736
1337	Seq. ID No. 2737	716522	716558	718135	Seq. ID No. 2738
1338	Seq. ID No. 2739	718855	718855	718586	Seq. ID No. 2740
1340a	Seq. ID No. 2741	718451	718490	718822	Seq. ID No. 2742
1340b	Seq. ID No. 2743	718451	718466	718822	Seq. ID No. 2744
1341a	Seq. ID No. 2745	718816	718858	719163	Seq. ID No. 2746
1341c	Seq. ID No. 2747	718816	718822	719163	Seq. ID No. 2748
1344a	Seq. ID No. 2749	719333	719396	720334	Seq. ID No. 2750
1344b	Seq. ID No. 2751	719333	719381	720334	Seq. ID No. 2752
1348	Seq. ID No. 2753	720382	720400	721263	Seq. ID No. 2754
1349a	Seq. ID No. 2755	721264	721312	722295	Seq. ID No. 2756
1349b	Seq. ID No. 2757	721264	721276	722295	Seq. ID No. 2758
1349c	Seq. ID No. 2759	721264	721267	722295	Seq. ID No. 2760
1350a	Seq. ID No. 2761	722342	722369	722797	Seq. ID No. 2762
1350b	Seq. ID No. 2763	722342	722348	722797	Seq. ID No. 2764
1353	Seq. ID No. 2765	722851	722869	723843	Seq. ID No. 2766
1355	Seq. ID No. 2767	723944	723944	725668	Seq. ID No. 2768
1358a	Seq. ID No. 2769	725732	725753	726643	Seq. ID No. 2770
1358b	Seq. ID No. 2771	725732	725732	726643	Seq. ID No. 2772
1359	Seq. ID No. 2773	726616	726640	727635	Seq. ID No. 2774
1361	Seq. ID No. 2775	727639	727651	728580	Seq. ID No. 2776
1364a	Seq. ID No. 2777	730140	730065	729379	Seq. ID No. 2778
1364b	Seq. ID No. 2779	730140	730092	729379	Seq. ID No. 2780
1364c	Seq. ID No. 2781	730140	730107	729379	Seq. ID No. 2782

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1365b	Seq. ID No. 2783	729761	729827	730129	Seq. ID No. 2784
1366a	Seq. ID No. 2785	730210	730483	730836	Seq. ID No. 2786
1366b	Seq. ID No. 2787	730210	730243	730836	Seq. ID No. 2788
1367	Seq. ID No. 2789	730970	730988	732001	Seq. ID No. 2790
1368	Seq. ID No. 2791	732002	732038	733033	Seq. ID No. 2792
1371	Seq. ID No. 2793	733169	733175	734359	Seq. ID No. 2794
1373a	Seq. ID No. 2795	734383	734389	735144	Seq. ID No. 2796
1373b	Seq. ID No. 2797	734383	734386	735144	Seq. ID No. 2798
1374	Seq. ID No. 2799	735111	735144	736679	Seq. ID No. 2800
1375	Seq. ID No. 2801	737472	737457	737191	Seq. ID No. 2802
1377	Seq. ID No. 2803	736676	736730	738028	Seq. ID No. 2804
1378	Seq. ID No. 2805	738364	738346	738119	Seq. ID No. 2806
1379	Seq. ID No. 2807	738645	738612	738340	Seq. ID No. 2808
1380	Seq. ID No. 2809	738987	738954	738646	Seq. ID No. 2810
1381a	Seq. ID No. 2811	738197	738560	739288	Seq. ID No. 2812
1381b	Seq. ID No. 2813	738197	738221	739288	Seq. ID No. 2814
1382	Seq. ID No. 2815	739289	739298	739879	Seq. ID No. 2816
1383	Seq. ID No. 2817	739834	739906	740064	Seq. ID No. 2818
1384a	Seq. ID No. 2819	740592	740637	740843	Seq. ID No. 2820
1384b	Seq. ID No. 2821	740592	740613	740843	Seq. ID No. 2822
1384c	Seq. ID No. 2823	740592	740607	740843	Seq. ID No. 2824
1386a	Seq. ID No. 2825	740904	740955	741692	Seq. ID No. 2826
1386b	Seq. ID No. 2827	740904	740949	741692	Seq. ID No. 2828
1387a	Seq. ID No. 2829	742161	741981	741694	Seq. ID No. 2830
1388b	Seq. ID No. 2831	741439	741448	741723	Seq. ID No. 2832
1389a	Seq. ID No. 2833	742245	742329	742586	Seq. ID No. 2834
1393a	Seq. ID No. 2835	744190	744004	743774	Seq. ID No. 2836
1393b	Seq. ID No. 2837	744190	744088	743774	Seq. ID No. 2838
1393c	Seq. ID No. 2839	744190	744118	743774	Seq. ID No. 2840

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1393d	Seq. ID No. 2841	744190	744172	743774	Seq. ID No. 2842
1394	Seq. ID No. 2843	741716	741716	744145	Seq. ID No. 2844
1395a	Seq. ID No. 2845	743835	743886	744179	Seq. ID No. 2846
1396	Seq. ID No. 2847	744166	744166	744624	Seq. ID No. 2848
1397	Seq. ID No. 2849	745009	745003	744779	Seq. ID No. 2850
1398	Seq. ID No. 2851	745395	745395	745583	Seq. ID No. 2852
1399a	Seq. ID No. 2853	746205	746151	745810	Seq. ID No. 2854
1399b	Seq. ID No. 2855	746205	746178	745810	Seq. ID No. 2856
1400	Seq. ID No. 2857	745613	745613	745813	Seq. ID No. 2858
1401	Seq. ID No. 2859	745943	745943	746104	Seq. ID No. 2860
1402c	Seq. ID No. 2861	746612	746558	746190	Seq. ID No. 2862
1405	Seq. ID No. 2863	746924	746924	749635	Seq. ID No. 2864
1407b	Seq. ID No. 2865	751061	751055	750588	Seq. ID No. 2866
1408	Seq. ID No. 2867	749626	749647	751767	Seq. ID No. 2868
1409	Seq. ID No. 2869	751768	751768	754359	Seq. ID No. 2870
1410	Seq. ID No. 2871	754341	754374	755108	Seq. ID No. 2872
1411a	Seq. ID No. 2873	755080	755485	755841	Seq. ID No. 2874
1411b	Seq. ID No. 2875	755080	755344	755841	Seq. ID No. 2876
1411c	Seq. ID No. 2877	755080	755092	755841	Seq. ID No. 2878
1412a	Seq. ID No. 2879	757589	757421	756222	Seq. ID No. 2880
1412b	Seq. ID No. 2881	757589	757586	756222	Seq. ID No. 2882
1414a	Seq. ID No. 2883	756988	757285	757674	Seq. ID No. 2884
1414b	Seq. ID No. 2885	756988	757180	757674	Seq. ID No. 2886
1414c	Seq. ID No. 2887	756988	757003	757674	Seq. ID No. 2888
1415	Seq. ID No. 2889	758110	758110	758241	Seq. ID No. 2890
1416	Seq. ID No. 2891	759768	759735	758569	Seq. ID No. 2892
1418	Seq. ID No. 2893	758771	758771	759010	Seq. ID No. 2894
1419	Seq. ID No. 2895	760783	760735	760511	Seq. ID No. 2896
1420a	Seq. ID No. 2897	760029	760194	760772	Seq. ID No. 2898

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1420b	Seq. ID No. 2899	760029	760029	760772	Seq. ID No. 2900
1422	Seq. ID No. 2901	760703	760775	762157	Seq. ID No. 2902
1423	Seq. ID No. 2903	762262	762283	762516	Seq. ID No. 2904
1426a	Seq. ID No. 2905	762510	762915	763571	Seq. ID No. 2906
1426b	Seq. ID No. 2907	762510	762528	763571	Seq. ID No. 2908
1427a	Seq. ID No. 2909	763552	763810	763941	Seq. ID No. 2910
1427b	Seq. ID No. 2911	763552	763564	763941	Seq. ID No. 2912
1428	Seq. ID No. 2913	763895	763949	764311	Seq. ID No. 2914
1429a	Seq. ID No. 2915	765122	765107	764379	Seq. ID No. 2916
1429b	Seq. ID No. 2917	765122	765116	764379	Seq. ID No. 2918
1431	Seq. ID No. 2919	765350	765365	766138	Seq. ID No. 2920
1432	Seq. ID No. 2921	766139	766154	767452	Seq. ID No. 2922
1433	Seq. ID No. 2923	767422	767449	768687	Seq. ID No. 2924
1434a	Seq. ID No. 2925	768641	768761	769153	Seq. ID No. 2926
1434b	Seq. ID No. 2927	768641	768674	769153	Seq. ID No. 2928
1437a	Seq. ID No. 2929	769101	769194	770588	Seq. ID No. 2930
1437b	Seq. ID No. 2931	769101	769185	770588	Seq. ID No. 2932
1437c	Seq. ID No. 2933	769101	769119	770588	Seq. ID No. 2934
1438	Seq. ID No. 2935	771081	771093	771485	Seq. ID No. 2936
1439a	Seq. ID No. 2937	771556	772081	772368	Seq. ID No. 2938
1439b	Seq. ID No. 2939	771556	771832	772368	Seq. ID No. 2940
1439c	Seq. ID No. 2941	771556	771688	772368	Seq. ID No. 2942
1439d	Seq. ID No. 2943	771556	771565	772368	Seq. ID No. 2944
1439e	Seq. ID No. 2945	771556	771556	772368	Seq. ID No. 2946
1440a	Seq. ID No. 2947	772260	773019	773900	Seq. ID No. 2948
1440b	Seq. ID No. 2949	772260	772659	773900	Seq. ID No. 2950
1440c	Seq. ID No. 2951	772260	772371	773900	Seq. ID No. 2952
1440d	Seq. ID No. 2953	772260	772347	773900	Seq. ID No. 2954
1442a	Seq. ID No. 2955	773837	774053	774535	Seq. ID No. 2956

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1442b	Seq. ID No. 2957	773837	773897	774535	Seq. ID No. 2958
1445a	Seq. ID No. 2959	774811	775252	775797	Seq. ID No. 2960
1445b	Seq. ID No. 2961	774811	775042	775797	Seq. ID No. 2962
1445c	Seq. ID No. 2963	774811	774853	775797	Seq. ID No. 2964
1446a	Seq. ID No. 2965	776293	776224	775967	Seq. ID No. 2966
1446b	Seq. ID No. 2967	776293	776278	775967	Seq. ID No. 2968
1447a	Seq. ID No. 2969	776362	776419	777786	Seq. ID No. 2970
1447b	Seq. ID No. 2971	776362	776377	777786	Seq. ID No. 2972
1448	Seq. ID No. 2973	778141	778195	778794	Seq. ID No. 2974
1449a	Seq. ID No. 2975	778847	778862	779716	Seq. ID No. 2976
1449b	Seq. ID No. 2977	778847	778853	779716	Seq. ID No. 2978
1451	Seq. ID No. 2979	779700	779706	780320	Seq. ID No. 2980
1452a	Seq. ID No. 2981	780286	780310	781452	Seq. ID No. 2982
1452b	Seq. ID No. 2983	780286	780295	781452	Seq. ID No. 2984
1453	Seq. ID No. 2985	781774	781777	782313	Seq. ID No. 2986
1454	Seq. ID No. 2987	782603	782594	782319	Seq. ID No. 2988
1455a	Seq. ID No. 2989	782323	782416	782772	Seq. ID No. 2990
1455b	Seq. ID No. 2991	782323	782359	782772	Seq. ID No. 2992
1456	Seq. ID No. 2993	783394	783373	782858	Seq. ID No. 2994
1457a	Seq. ID No. 2995	785272	784672	783587	Seq. ID No. 2996
1457b	Seq. ID No. 2997	785272	784795	783587	Seq. ID No. 2998
1457c	Seq. ID No. 2999	785272	785272	783587	Seq. ID No. 3000
1459	Seq. ID No. 3001	785453	785486	785917	Seq. ID No. 3002
1462a	Seq. ID No. 3003	785979	786078	787760	Seq. ID No. 3004
1462b	Seq. ID No. 3005	785979	785994	787760	Seq. ID No. 3006
1463a	Seq. ID No. 3007	787735	787813	788136	Seq. ID No. 3008
1463b	Seq. ID No. 3009	787735	787753	788136	Seq. ID No. 3010
1463c	Seq. ID No. 3011	787735	787747	788136	Seq. ID No. 3012
1466a	Seq. ID No. 3013	788108	788501	789526	Seq. ID No. 3014



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1466b	Seq. ID No. 3015	788108	788249	789526	Seq. ID No. 3016
1466c	Seq. ID No. 3017	788108	788147	789526	Seq. ID No. 3018
1466d	Seq. ID No. 3019	788108	788120	789526	Seq. ID No. 3020
1467	Seq. ID No. 3021	790286	790256	789855	Seq. ID No. 3022
1469a	Seq. ID No. 3023	789757	790642	791115	Seq. ID No. 3024
1469b	Seq. ID No. 3025	789757	790531	791115	Seq. ID No. 3026
1469c	Seq. ID No. 3027	789757	789769	791115	Seq. ID No. 3028
1470a	Seq. ID No. 3029	792128	791798	791205	Seq. ID No. 3030
1470b	Seq. ID No. 3031	792128	792008	791205	Seq. ID No. 3032
1470c	Seq. ID No. 3033	792128	792116	791205	Seq. ID No. 3034
1471	Seq. ID No. 3035	792254	792257	793039	Seq. ID No. 3036
1472b	Seq. ID No. 3037	793681	793612	793046	Seq. ID No. 3038
1472c	Seq. ID No. 3039	793681	793666	793046	Seq. ID No. 3040
1474	Seq. ID No. 3041	793841	793841	794050	Seq. ID No. 3042
1475	Seq. ID No. 3043	794342	794369	795070	Seq. ID No. 3044
1476	Seq. ID No. 3045	795230	795236	795805	Seq. ID No. 3046
1477a	Seq. ID No. 3047	796616	796430	795831	Seq. ID No. 3048
1477b	Seq. ID No. 3049	796616	796589	795831	Seq. ID No. 3050
1479a	Seq. ID No. 3051	796810	797002	798135	Seq. ID No. 3052
1479b	Seq. ID No. 3053	796810	796867	798135	Seq. ID No. 3054
1479c	Seq. ID No. 3055	796810	796813	798135	Seq. ID No. 3056
1482a	Seq. ID No. 3057	798771	798831	799577	Seq. ID No. 3058
1482b	Seq. ID No. 3059	798771	798774	799577	Seq. ID No. 3060
1483	Seq. ID No. 3061	799724	799736	800257	Seq. ID No. 3062
1484a	Seq. ID No. 3063	800458	801334	801843	Seq. ID No. 3064
1484b	Seq. ID No. 3065	800458	800473	801843	Seq. ID No. 3066
1484c	Seq. ID No. 3067	800458	800458	801843	Seq. ID No. 3068
1486	Seq. ID No. 3069	801844	801853	802452	Seq. ID No. 3070
1487	Seq. ID No. 3071	802771	802768	802532	Seq. ID No. 3072

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1488a	Seq. ID No. 3073	802224	802977	803219	Seq. ID No. 3074
1488b	Seq. ID No. 3075	802224	802917	803219	Seq. ID No. 3076
1488c	Seq. ID No. 3077	802224	802788	803219	Seq. ID No. 3078
1488d	Seq. ID No. 3079	802224	802464	803219	Seq. ID No. 3080
1488e	Seq. ID No. 3081	802224	802431	803219	Seq. ID No. 3082
1488f	Seq. ID No. 3083	802224	802377	803219	Seq. ID No. 3084
1488g	Seq. ID No. 3085	802224	802323	803219	Seq. ID No. 3086
1489	Seq. ID No. 3087	803568	803550	803326	Seq. ID No. 3088
1490	Seq. ID No. 3089	803135	803330	803674	Seq. ID No. 3090
1494	Seq. ID No. 3091	803890	803929	805041	Seq. ID No. 3092
1497	Seq. ID No. 3093	805042	805048	806508	Seq. ID No. 3094
1498a	Seq. ID No. 3095	806363	806543	807457	Seq. ID No. 3096
1498b	Seq. ID No. 3097	806363	806423	807457	Seq. ID No. 3098
1498c	Seq. ID No. 3099	806363	806396	807457	Seq. ID No. 3100
1498d	Seq. ID No. 3101	806363	806393	807457	Seq. ID No. 3102
1499	Seq. ID No. 3103	809397	809382	808153	Seq. ID No. 3104
1502a	Seq. ID No. 3105	809502	809565	809828	Seq. ID No. 3106
1502b	Seq. ID No. 3107	809502	809502	809828	Seq. ID No. 3108
1503a	Seq. ID No. 3109	809829	809847	810431	Seq. ID No. 3110
1503b	Seq. ID No. 3111	809829	809835	810431	Seq. ID No. 3112
1506a	Seq. ID No. 3113	810510	810666	812906	Seq. ID No. 3114
1506b	Seq. ID No. 3115	810510	810621	812906	Seq. ID No. 3116
1506c	Seq. ID No. 3117	810510	810525	812906	Seq. ID No. 3118
1507a	Seq. ID No. 3119	813291	813231	812944	Seq. ID No. 3120
1507b	Seq. ID No. 3121	813291	813246	812944	Seq. ID No. 3122
1507c	Seq. ID No. 3123	813291	813282	812944	Seq. ID No. 3124
1508	Seq. ID No. 3125	812996	813032	813340	Seq. ID No. 3126
1510a	Seq. ID No. 3127	813521	813737	815023	Seq. ID No. 3128
1510b	Seq. ID No. 3129	813521	813704	815023	Seq. ID No. 3130

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1510c	Seq. ID No. 3131	813521	813545	815023	Seq. ID No. 3132
1510d	Seq. ID No. 3133	813521	813524	815023	Seq. ID No. 3134
1511	Seq. ID No. 3135	815078	815084	815920	Seq. ID No. 3136
1512	Seq. ID No. 3137	815892	815910	816524	Seq. ID No. 3138
1513a	Seq. ID No. 3139	816525	816570	817034	Seq. ID No. 3140
1513b	Seq. ID No. 3141	816525	816525	817034	Seq. ID No. 3142
1516	Seq. ID No. 3143	817055	817070	817537	Seq. ID No. 3144
1517a	Seq. ID No. 3145	818704	818314	817709	Seq. ID No. 3146
1517b	Seq. ID No. 3147	818704	818608	817709	Seq. ID No. 3148
1517c	Seq. ID No. 3149	818704	818614	817709	Seq. ID No. 3150
1518a	Seq. ID No. 3151	818067	818139	818636	Seq. ID No. 3152
1518b	Seq. ID No. 3153	818067	818085	818636	Seq. ID No. 3154
1520	Seq. ID No. 3155	818738	818753	819112	Seq. ID No. 3156
1522	Seq. ID No. 3157	819117	819150	819596	Seq. ID No. 3158
1523	Seq. ID No. 3159	820780	820756	819647	Seq. ID No. 3160
1528	Seq. ID No. 3161	820968	820968	821969	Seq. ID No. 3162
1530a	Seq. ID No. 3163	824730	824625	822091	Seq. ID No. 3164
1530b	Seq. ID No. 3165	824730	824706	822091	Seq. ID No. 3166
1533a	Seq. ID No. 3167	825870	825864	825565	Seq. ID No. 3168
1534a	Seq. ID No. 3169	824975	825119	826375	Seq. ID No. 3170
1534b	Seq. ID No. 3171	824975	824981	826375	Seq. ID No. 3172
1535a	Seq. ID No. 3173	826056	826164	826391	Seq. ID No. 3174
1536a	Seq. ID No. 3175	826336	826537	826698	Seq. ID No. 3176
1536b	Seq. ID No. 3177	826336	826345	826698	Seq. ID No. 3178
1537	Seq. ID No. 3179	827893	827875	826907	Seq. ID No. 3180
1542	Seq. ID No. 3181	829139	829166	829660	Seq. ID No. 3182
1543	Seq. ID No. 3183	828142	828145	829974	Seq. ID No. 3184
1544	Seq. ID No. 3185	832325	832298	830493	Seq. ID No. 3186
1547a	Seq. ID No. 3187	832494	832638	833225	Seq. ID No. 3188

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1547b	Seq. ID No. 3189	832494	832497	833225	Seq. ID No. 3190
1548	Seq. ID No. 3191	834559	834523	833408	Seq. ID No. 3192
1552	Seq. ID No. 3193	836319	836316	836029	Seq. ID No. 3194
1553a	Seq. ID No. 3195	835285	835321	836385	Seq. ID No. 3196
1553b	Seq. ID No. 3197	835285	835303	836385	Seq. ID No. 3198
1554a	Seq. ID No. 3199	836324	837011	837400	Seq. ID No. 3200
1554b	Seq. ID No. 3201	836324	836807	837400	Seq. ID No. 3202
1554c	Seq. ID No. 3203	836324	836333	837400	Seq. ID No. 3204
1555	Seq. ID No. 3205	837622	837649	839016	Seq. ID No. 3206
1556a	Seq. ID No. 3207	839851	840013	840648	Seq. ID No. 3208
1556b	Seq. ID No. 3209	839851	839893	840648	Seq. ID No. 3210
1556c	Seq. ID No. 3211	839851	839860	840648	Seq. ID No. 3212
1557a	Seq. ID No. 3213	840617	840911	841375	Seq. ID No. 3214
1557b	Seq. ID No. 3215	840617	840770	841375	Seq. ID No. 3216
1557c	Seq. ID No. 3217	840617	840632	841375	Seq. ID No. 3218
1559a	Seq. ID No. 3219	841324	841705	842100	Seq. ID No. 3220
1559b	Seq. ID No. 3221	841324	841372	842100	Seq. ID No. 3222
1563	Seq. ID No. 3223	843403	843385	843149	Seq. ID No. 3224
1564a	Seq. ID No. 3225	842064	842112	843983	Seq. ID No. 3226
1564b	Seq. ID No. 3227	842064	842106	843983	Seq. ID No. 3228
1565	Seq. ID No. 3229	845451	845418	844252	Seq. ID No. 3230
1567	Seq. ID No. 3231	845601	845766	845942	Seq. ID No. 3232
1568b	Seq. ID No. 3233	845896	845899	846222	Seq. ID No. 3234
1569	Seq. ID No. 3235	846223	846256	846519	Seq. ID No. 3236
1570	Seq. ID No. 3237	846792	846792	846953	Seq. ID No. 3238
1571	Seq. ID No. 3239	847452	847467	848087	Seq. ID No. 3240
1572a	Seq. ID No. 3241	848056	849394	849630	Seq. ID No. 3242
1572b	Seq. ID No. 3243	848056	848599	849630	Seq. ID No. 3244
1572c	Seq. ID No. 3245	848056	848353	849630	Seq. ID No. 3246

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1572d	Seq. ID No. 3247	848056	848200	849630	Seq. ID No. 3248
1572e	Seq. ID No. 3249	848056	848065	849630	Seq. ID No. 3250
1573	Seq. ID No. 3251	849498	849618	850292	Seq. ID No. 3252
1576	Seq. ID No. 3253	850427	850442	851671	Seq. ID No. 3254
1577a	Seq. ID No. 3255	852156	852168	852893	Seq. ID No. 3256
1577b	Seq. ID No. 3257	852156	852165	852893	Seq. ID No. 3258
1578	Seq. ID No. 3259	852839	852860	853744	Seq. ID No. 3260
1580a	Seq. ID No. 3261	854091	854103	854405	Seq. ID No. 3262
1580b	Seq. ID No. 3263	854091	854091	854405	Seq. ID No. 3264
1581	Seq. ID No. 3265	854392	854407	854871	Seq. ID No. 3266
1582a	Seq. ID No. 3267	854822	854933	855163	Seq. ID No. 3268
1582b	Seq. ID No. 3269	854822	854855	855163	Seq. ID No. 3270
1582c	Seq. ID No. 3271	854822	854837	855163	Seq. ID No. 3272
1584	Seq. ID No. 3273	855136	855160	855618	Seq. ID No. 3274
1585a	Seq. ID No. 3275	855593	855626	856216	Seq. ID No. 3276
1585b	Seq. ID No. 3277	855593	855602	856216	Seq. ID No. 3278
1587a	Seq. ID No. 3279	856349	856619	857485	Seq. ID No. 3280
1587b	Seq. ID No. 3281	856349	856424	857485	Seq. ID No. 3282
1587c	Seq. ID No. 3283	856349	856373	857485	Seq. ID No. 3284
1588	Seq. ID No. 3285	857486	857504	858061	Seq. ID No. 3286
1590	Seq. ID No. 3287	858037	858088	858495	Seq. ID No. 3288
1591	Seq. ID No. 3289	858485	858488	858988	Seq. ID No. 3290
1592a	Seq. ID No. 3291	859040	859280	860416	Seq. ID No. 3292
1592b	Seq. ID No. 3293	859040	859052	860416	Seq. ID No. 3294
1593	Seq. ID No. 3295	860376	860406	860675	Seq. ID No. 3296
1594a	Seq. ID No. 3297	860676	860784	861578	Seq. ID No. 3298
1594b	Seq. ID No. 3299	860676	860685	861578	Seq. ID No. 3300
1595a	Seq. ID No. 3301	861559	861571	862377	Seq. ID No. 3302
1595b	Seq. ID No. 3303	861559	861562	862377	Seq. ID No. 3304

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1598a	Seq. ID No. 3305	862517	862631	864310	Seq. ID No. 3306
1598b	Seq. ID No. 3307	862517	862601	864310	Seq. ID No. 3308
1600a	Seq. ID No. 3309	864687	864807	866219	Seq. ID No. 3310
1600b	Seq. ID No. 3311	864687	864798	866219	Seq. ID No. 3312
1600c	Seq. ID No. 3313	864687	864702	866219	Seq. ID No. 3314
1602	Seq. ID No. 3315	866403	866418	867107	Seq. ID No. 3316
1606a	Seq. ID No. 3317	867044	867632	868624	Seq. ID No. 3318
1606b	Seq. ID No. 3319	867044	867104	868624	Seq. ID No. 3320
1607a	Seq. ID No. 3321	869654	869564	868668	Seq. ID No. 3322
1607b	Seq. ID No. 3323	869654	869636	868668	Seq. ID No. 3324
1608	Seq. ID No. 3325	868639	868657	868893	Seq. ID No. 3326
1610a	Seq. ID No. 3327	870103	870085	869714	Seq. ID No. 3328
1610b	Seq. ID No. 3329	870103	870094	869714	Seq. ID No. 3330
1612	Seq. ID No. 3331	871769	871679	871356	Seq. ID No. 3332
1616a	Seq. ID No. 3333	870406	870709	872826	Seq. ID No. 3334
1616b	Seq. ID No. 3335	870406	870418	872826	Seq. ID No. 3336
1619	Seq. ID No. 3337	873157	873166	874266	Seq. ID No. 3338
1621	Seq. ID No. 3339	875446	875428	875066	Seq. ID No. 3340
1622a	Seq. ID No. 3341	875866	875788	875537	Seq. ID No. 3342
1623a	Seq. ID No. 3343	874398	874665	875993	Seq. ID No. 3344
1623b	Seq. ID No. 3345	874398	874437	875993	Seq. ID No. 3346
1623c	Seq. ID No. 3347	874398	874410	875993	Seq. ID No. 3348
1624	Seq. ID No. 3349	876797	876749	876447	Seq. ID No. 3350
1625a	Seq. ID No. 3351	875908	876511	877038	Seq. ID No. 3352
1625b	Seq. ID No. 3353	875908	875974	877038	Seq. ID No. 3354
1625c	Seq. ID No. 3355	875908	875935	877038	Seq. ID No. 3356
1626a	Seq. ID No. 3357	876984	877617	877994	Seq. ID No. 3358
1626b	Seq. ID No. 3359	876984	877038	877994	Seq. ID No. 3360
1628a	Seq. ID No. 3361	878218	878263	879225	Seq. ID No. 3362

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1628b	Seq. ID No. 3363	878218	878233	879225	Seq. ID No. 3364
1632a	Seq. ID No. 3365	880585	880471	879908	Seq. ID No. 3366
1632b	Seq. ID No. 3367	880585	880525	879908	Seq. ID No. 3368
1633a	Seq. ID No. 3369	882546	882498	882007	Seq. ID No. 3370
1633b	Seq. ID No. 3371	882546	882543	882007	Seq. ID No. 3372
1634a	Seq. ID No. 3373	880656	880746	882020	Seq. ID No. 3374
1634b	Seq. ID No. 3375	880656	880707	882020	Seq. ID No. 3376
1634c	Seq. ID No. 3377	880656	880659	882020	Seq. ID No. 3378
1639b	Seq. ID No. 3379	881983	881992	883659	Seq. ID No. 3380
1642a	Seq. ID No. 3381	883922	883976	886069	Seq. ID No. 3382
1642b	Seq. ID No. 3383	883922	883934	886069	Seq. ID No. 3384
1643a	Seq. ID No. 3385	886023	886074	886400	Seq. ID No. 3386
1643b	Seq. ID No. 3387	886023	886035	886400	Seq. ID No. 3388
1646a	Seq. ID No. 3389	886658	888038	888331	Seq. ID No. 3390
1646b	Seq. ID No. 3391	886658	887708	888331	Seq. ID No. 3392
1646c	Seq. ID No. 3393	886658	886886	888331	Seq. ID No. 3394
1646d	Seq. ID No. 3395	886658	886745	888331	Seq. ID No. 3396
1646e	Seq. ID No. 3397	886658	886664	888331	Seq. ID No. 3398
1646f	Seq. ID No. 3399	886658	886658	888331	Seq. ID No. 3400
1647	Seq. ID No. 3401	888398	888425	889144	Seq. ID No. 3402
1648b	Seq. ID No. 3403	890392	890371	890099	Seq. ID No. 3404
1649a	Seq. ID No. 3405	891564	891375	890626	Seq. ID No. 3406
1649b	Seq. ID No. 3407	891564	891537	890626	Seq. ID No. 3408
1649c	Seq. ID No. 3409	891564	891555	890626	Seq. ID No. 3410
1652a	Seq. ID No. 3411	891565	891646	893049	Seq. ID No. 3412
1652b	Seq. ID No. 3413	891565	891580	893049	Seq. ID No. 3414
1654	Seq. ID No. 3415	893169	893250	894092	Seq. ID No. 3416
1656b	Seq. ID No. 3417	894132	894327	894650	Seq. ID No. 3418
1657	Seq. ID No. 3419	895472	895439	895203	Seq. ID No. 3420

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1659a	Seq. ID No. 3421	894949	896161	896691	Seq. ID No. 3422
1659b	Seq. ID No. 3423	894949	895030	896691	Seq. ID No. 3424
1659c	Seq. ID No. 3425	894949	894982	896691	Seq. ID No. 3426
1660b	Seq. ID No. 3427	896222	896285	896725	Seq. ID No. 3428
1662a	Seq. ID No. 3429	896963	896975	897847	Seq. ID No. 3430
1662b	Seq. ID No. 3431	896963	896963	897847	Seq. ID No. 3432
1663	Seq. ID No. 3433	898657	898648	898361	Seq. ID No. 3434
1664	Seq. ID No. 3435	897988	898021	898602	Seq. ID No. 3436
1665a	Seq. ID No. 3437	898458	898578	898913	Seq. ID No. 3438
1668	Seq. ID No. 3439	899037	899052	899945	Seq. ID No. 3440
1669	Seq. ID No. 3441	900663	900630	900307	Seq. ID No. 3442
1670a	Seq. ID No. 3443	900059	900101	900757	Seq. ID No. 3444
1670b	Seq. ID No. 3445	900059	900089	900757	Seq. ID No. 3446
1670c	Seq. ID No. 3447	900059	900068	900757	Seq. ID No. 3448
1673a	Seq. ID No. 3449	900778	902047	902286	Seq. ID No. 3450
1673b	Seq. ID No. 3451	900778	901402	902286	Seq. ID No. 3452
1673c	Seq. ID No. 3453	900778	901204	902286	Seq. ID No. 3454
1673d	Seq. ID No. 3455	900778	901018	902286	Seq. ID No. 3456
1673e	Seq. ID No. 3457	900778	900898	902286	Seq. ID No. 3458
1673f	Seq. ID No. 3459	900778	900814	902286	Seq. ID No. 3460
1674	Seq. ID No. 3461	902433	902532	903383	Seq. ID No. 3462
1675a	Seq. ID No. 3463	904184	904340	905383	Seq. ID No. 3464
1675b	Seq. ID No. 3465	904184	904208	905383	Seq. ID No. 3466
1675c	Seq. ID No. 3467	904184	904184	905383	Seq. ID No. 3468
1676	Seq. ID No. 3469	905424	905451	905852	Seq. ID No. 3470
1677	Seq. ID No. 3471	907317	907284	906022	Seq. ID No. 3472
1679	Seq. ID No. 3473	907448	907472	908014	Seq. ID No. 3474
1680	Seq. ID No. 3475	908628	908625	908176	Seq. ID No. 3476
1682a	Seq. ID No. 3477	908785	908872	909591	Seq. ID No. 3478



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1682b	Seq. ID No. 3479	908785	908803	909591	Seq. ID No. 3480
1683a	Seq. ID No. 3481	909633	910008	910523	Seq. ID No. 3482
1683b	Seq. ID No. 3483	909633	909669	910523	Seq. ID No. 3484
1684	Seq. ID No. 3485	911359	911347	910640	Seq. ID No. 3486
1685	Seq. ID No. 3487	912399	912375	911350	Seq. ID No. 3488
1687	Seq. ID No. 3489	912556	912568	912813	Seq. ID No. 3490
1688a	Seq. ID No. 3491	912536	913217	913645	Seq. ID No. 3492
1688b	Seq. ID No. 3493	912536	912641	913645	Seq. ID No. 3494
1688c	Seq. ID No. 3495	912536	912539	913645	Seq. ID No. 3496
1689a	Seq. ID No. 3497	913587	913638	914393	Seq. ID No. 3498
1689b	Seq. ID No. 3499	913587	913602	914393	Seq. ID No. 3500
1689c	Seq. ID No. 3501	913587	913596	914393	Seq. ID No. 3502
1690a	Seq. ID No. 3503	914420	914993	915481	Seq. ID No. 3504
1690b	Seq. ID No. 3505	914420	914423	915481	Seq. ID No. 3506
1691	Seq. ID No. 3507	915482	915497	916570	Seq. ID No. 3508
1692	Seq. ID No. 3509	916577	916586	917389	Seq. ID No. 3510
1693	Seq. ID No. 3511	917802	917814	919235	Seq. ID No. 3512
1694a	Seq. ID No. 3513	919415	919634	920410	Seq. ID No. 3514
1694b	Seq. ID No. 3515	919415	919559	920410	Seq. ID No. 3516
1694c	Seq. ID No. 3517	919415	919424	920410	Seq. ID No. 3518
1694d	Seq. ID No. 3519	919415	919415	920410	Seq. ID No. 3520
1696	Seq. ID No. 3521	920424	920427	921608	Seq. ID No. 3522
1697a	Seq. ID No. 3523	921701	921848	922666	Seq. ID No. 3524
1697b	Seq. ID No. 3525	921701	921710	922666	Seq. ID No. 3526
1699a	Seq. ID No. 3527	922706	923171	924190	Seq. ID No. 3528
1699b	Seq. ID No. 3529	922706	922706	924190	Seq. ID No. 3530
1700a	Seq. ID No. 3531	924300	924342	924713	Seq. ID No. 3532
1700b	Seq. ID No. 3533	924300	924303	924713	Seq. ID No. 3534
1701a	Seq. ID No. 3535	925996	925984	924812	Seq. ID No. 3536

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1701b	Seq. ID No. 3537	925996	925987	924812	Seq. ID No. 3538
1703b	Seq. ID No. 3539	924930	924948	925280	Seq. ID No. 3540
1704a	Seq. ID No. 3541	926230	926311	926853	Seq. ID No. 3542
1704b	Seq. ID No. 3543	926230	926239	926853	Seq. ID No. 3544
1705a	Seq. ID No. 3545	927259	927289	927513	Seq. ID No. 3546
1705b	Seq. ID No. 3547	927259	927283	927513	Seq. ID No. 3548
1706	Seq. ID No. 3549	926847	926850	927800	Seq. ID No. 3550
1707a	Seq. ID No. 3551	928874	928865	928023	Seq. ID No. 3552
1707b	Seq. ID No. 3553	928874	928868	928023	Seq. ID No. 3554
1708	Seq. ID No. 3555	928398	928443	928799	Seq. ID No. 3556
1709	Seq. ID No. 3557	929780	929798	930049	Seq. ID No. 3558
1710a	Seq. ID No. 3559	929083	929158	930066	Seq. ID No. 3560
1710b	Seq. ID No. 3561	929083	929098	930066	Seq. ID No. 3562
1712a	Seq. ID No. 3563	930274	930283	931269	Seq. ID No. 3564
1712b	Seq. ID No. 3565	930274	930277	931269	Seq. ID No. 3566
1715a	Seq. ID No. 3567	931778	931790	932497	Seq. ID No. 3568
1715b	Seq. ID No. 3569	931778	931787	932497	Seq. ID No. 3570
1718a	Seq. ID No. 3571	932926	932998	933222	Seq. ID No. 3572
1718b	Seq. ID No. 3573	932926	932956	933222	Seq. ID No. 3574
1722	Seq. ID No. 3575	932562	932577	936251	Seq. ID No. 3576
1723a	Seq. ID No. 3577	936220	936388	937206	Seq. ID No. 3578
1723b	Seq. ID No. 3579	936220	936226	937206	Seq. ID No. 3580
1724	Seq. ID No. 3581	937832	937808	937542	Seq. ID No. 3582
1727	Seq. ID No. 3583	937230	937248	938735	Seq. ID No. 3584
1728	Seq. ID No. 3585	938736	938766	939101	Seq. ID No. 3586
1731	Seq. ID No. 3587	940559	940523	940092	Seq. ID No. 3588
1733	Seq. ID No. 3589	939109	939109	940608	Seq. ID No. 3590
1734	Seq. ID No. 3591	940535	940625	940846	Seq. ID No. 3592
1735a	Seq. ID No. 3593	941618	941300	940989	Seq. ID No. 3594

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1735b	Seq. ID No. 3595	941618	941555	940989	Seq. ID No. 3596
1737a	Seq. ID No. 3597	941044	941542	945477	Seq. ID No. 3598
1737b	Seq. ID No. 3599	941044	941326	945477	Seq. ID No. 3600
1738a	Seq. ID No. 3601	945878	946205	946741	Seq. ID No. 3602
1738b	Seq. ID No. 3603	945878	945977	946741	Seq. ID No. 3604
1738c	Seq. ID No. 3605	945878	945908	946741	Seq. ID No. 3606
1739	Seq. ID No. 3607	946742	946859	947188	Seq. ID No. 3608
1741	Seq. ID No. 3609	947264	947297	948463	Seq. ID No. 3610
1743	Seq. ID No. 3611	949075	949111	950652	Seq. ID No. 3612
1744a	Seq. ID No. 3613	950653	951049	951951	Seq. ID No. 3614
1744b	Seq. ID No. 3615	950653	950716	951951	Seq. ID No. 3616
1745	Seq. ID No. 3617	952788	952791	953084	Seq. ID No. 3618
1747	Seq. ID No. 3619	952652	952664	954949	Seq. ID No. 3620
1749a	Seq. ID No. 3621	957393	957060	956695	Seq. ID No. 3622
1749b	Seq. ID No. 3623	957393	957297	956695	Seq. ID No. 3624
1750a	Seq. ID No. 3625	957380	957347	957060	Seq. ID No. 3626
1752a	Seq. ID No. 3627	955633	956623	957144	Seq. ID No. 3628
1752b	Seq. ID No. 3629	955633	955708	957144	Seq. ID No. 3630
1753	Seq. ID No. 3631	957145	957193	957429	Seq. ID No. 3632
1756a	Seq. ID No. 3633	957791	957923	958780	Seq. ID No. 3634
1756b	Seq. ID No. 3635	957791	957803	958780	Seq. ID No. 3636
1757a	Seq. ID No. 3637	959675	959477	958860	Seq. ID No. 3638
1757b	Seq. ID No. 3639	959675	959555	958860	Seq. ID No. 3640
1759	Seq. ID No. 3641	959662	959665	959976	Seq. ID No. 3642
1760	Seq. ID No. 3643	959998	960001	960330	Seq. ID No. 3644
1762	Seq. ID No. 3645	960400	960412	960936	Seq. ID No. 3646
1764a	Seq. ID No. 3647	960937	960970	961668	Seq. ID No. 3648
1764b	Seq. ID No. 3649	960937	960952	961668	Seq. ID No. 3650
1764c	Seq. ID No. 3651	960937	960937	961668	Seq. ID No. 3652

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1765	Seq. ID No. 3653	962620	962575	961790	Seq. ID No. 3654
1766	Seq. ID No. 3655	962761	962761	962645	Seq. ID No. 3656
1767a	Seq. ID No. 3657	963674	963638	962793	Seq. ID No. 3658
1767b	Seq. ID No. 3659	963674	963671	962793	Seq. ID No. 3660
1769a	Seq. ID No. 3661	963809	964073	964522	Seq. ID No. 3662
1769b	Seq. ID No. 3663	963809	963842	964522	Seq. ID No. 3664
1771	Seq. ID No. 3665	964635	964641	965921	Seq. ID No. 3666
1773	Seq. ID No. 3667	965922	965931	966497	Seq. ID No. 3668
1774	Seq. ID No. 3669	966556	966556	966882	Seq. ID No. 3670
1775a	Seq. ID No. 3671	966897	967200	968219	Seq. ID No. 3672
1775b	Seq. ID No. 3673	966897	967089	968219	Seq. ID No. 3674
1775c	Seq. ID No. 3675	966897	966909	968219	Seq. ID No. 3676
1778a	Seq. ID No. 3677	970818	970803	970543	Seq. ID No. 3678
1778b	Seq. ID No. 3679	970818	970812	970543	Seq. ID No. 3680
1780	Seq. ID No. 3681	968216	968234	971017	Seq. ID No. 3682
1783a	Seq. ID No. 3683	972121	972085	971618	Seq. ID No. 3684
1783b	Seq. ID No. 3685	972121	972103	971618	Seq. ID No. 3686
1784a	Seq. ID No. 3687	971018	971165	971623	Seq. ID No. 3688
1784b	Seq. ID No. 3689	971018	971144	971623	Seq. ID No. 3690
1788a	Seq. ID No. 3691	971657	972002	972955	Seq. ID No. 3692
1788b	Seq. ID No. 3693	971657	971762	972955	Seq. ID No. 3694
1788c	Seq. ID No. 3695	971657	971660	972955	Seq. ID No. 3696
1789a	Seq. ID No. 3697	973047	973068	973802	Seq. ID No. 3698
1789b	Seq. ID No. 3699	973047	973065	973802	Seq. ID No. 3700
1790a	Seq. ID No. 3701	974447	974363	974136	Seq. ID No. 3702
1790b	Seq. ID No. 3703	974447	974393	974136	Seq. ID No. 3704
1792a	Seq. ID No. 3705	973813	973930	974529	Seq. ID No. 3706
1792b	Seq. ID No. 3707	973813	973918	974529	Seq. ID No. 3708
1792c	Seq. ID No. 3709	973813	973882	974529	Seq. ID No. 3710

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1793a	Seq. ID No. 3711	976354	976111	974645	Seq. ID No. 3712
1793b	Seq. ID No. 3713	976354	976339	974645	Seq. ID No. 3714
1793c	Seq. ID No. 3715	976354	976348	974645	Seq. ID No. 3716
1794a	Seq. ID No. 3717	974942	975002	975253	Seq. ID No. 3718
1797a	Seq. ID No. 3719	976552	976615	977007	Seq. ID No. 3720
1797b	Seq. ID No. 3721	976552	976576	977007	Seq. ID No. 3722
1798a	Seq. ID No. 3723	977119	977431	977703	Seq. ID No. 3724
1798b	Seq. ID No. 3725	977119	977155	977703	Seq. ID No. 3726
1798c	Seq. ID No. 3727	977119	977119	977703	Seq. ID No. 3728
1800	Seq. ID No. 3729	977713	977731	978411	Seq. ID No. 3730
1802a	Seq. ID No. 3731	978665	978695	979249	Seq. ID No. 3732
1802b	Seq. ID No. 3733	978665	978674	979249	Seq. ID No. 3734
1803	Seq. ID No. 3735	979246	979252	979512	Seq. ID No. 3736
1804a	Seq. ID No. 3737	979506	979521	979817	Seq. ID No. 3738
1804b	Seq. ID No. 3739	979506	979512	979817	Seq. ID No. 3740
1805	Seq. ID No. 3741	979818	979821	980378	Seq. ID No. 3742
1806a	Seq. ID No. 3743	980320	980392	981078	Seq. ID No. 3744
1806b	Seq. ID No. 3745	980320	980371	981078	Seq. ID No. 3746
1806c	Seq. ID No. 3747	980320	980338	981078	Seq. ID No. 3748
1807a	Seq. ID No. 3749	981100	981109	981456	Seq. ID No. 3750
1807b	Seq. ID No. 3751	981100	981100	981456	Seq. ID No. 3752
1808a	Seq. ID No. 3753	981441	982707	983054	Seq. ID No. 3754
1808b	Seq. ID No. 3755	981441	982521	983054	Seq. ID No. 3756
1808c	Seq. ID No. 3757	981441	982008	983054	Seq. ID No. 3758
1808d	Seq. ID No. 3759	981441	981453	983054	Seq. ID No. 3760
1809a	Seq. ID No. 3761	983069	984152	984700	Seq. ID No. 3762
1809b	Seq. ID No. 3763	983069	983858	984700	Seq. ID No. 3764
1809c	Seq. ID No. 3765	983069	983705	984700	Seq. ID No. 3766
1809d	Seq. ID No. 3767	983069	983258	984700	Seq. ID No. 3768

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1809e	Seq. ID No. 3769	983069	983093	984700	Seq. ID No. 3770
1809f	Seq. ID No. 3771	983069	983090	984700	Seq. ID No. 3772
1810a	Seq. ID No. 3773	984753	984786	985220	Seq. ID No. 3774
1810b	Seq. ID No. 3775	984753	984777	985220	Seq. ID No. 3776
1811a	Seq. ID No. 3777	985498	985525	986454	Seq. ID No. 3778
1811b	Seq. ID No. 3779	985498	985504	986454	Seq. ID No. 3780
1812a	Seq. ID No. 3781	986785	986863	987144	Seq. ID No. 3782
1812b	Seq. ID No. 3783	986785	986821	987144	Seq. ID No. 3784
1813	Seq. ID No. 3785	987852	987849	987478	Seq. ID No. 3786
1815a	Seq. ID No. 3787	988694	988457	988041	Seq. ID No. 3788
1815b	Seq. ID No. 3789	988694	988541	988041	Seq. ID No. 3790
1815c	Seq. ID No. 3791	988694	988565	988041	Seq. ID No. 3792
1816a	Seq. ID No. 3793	990681	990537	988399	Seq. ID No. 3794
1816b	Seq. ID No. 3795	990681	990672	988399	Seq. ID No. 3796
1816c	Seq. ID No. 3797	990681	990675	988399	Seq. ID No. 3798
1817a	Seq. ID No. 3799	988113	988182	988472	Seq. ID No. 3800
1819a	Seq. ID No. 3801	991399	991240	990737	Seq. ID No. 3802
1819b	Seq. ID No. 3803	991399	991372	990737	Seq. ID No. 3804
1821	Seq. ID No. 3805	991399	991462	992019	Seq. ID No. 3806
1822	Seq. ID No. 3807	992670	992622	992392	Seq. ID No. 3808
1823a	Seq. ID No. 3809	992081	992093	992791	Seq. ID No. 3810
1823b	Seq. ID No. 3811	992081	992084	992791	Seq. ID No. 3812
1825	Seq. ID No. 3813	993363	993384	993830	Seq. ID No. 3814
1826a	Seq. ID No. 3815	994009	994021	994287	Seq. ID No. 3816
1826b	Seq. ID No. 3817	994009	994015	994287	Seq. ID No. 3818
1828	Seq. ID No. 3819	993831	993834	994970	Seq. ID No. 3820
1830a	Seq. ID No. 3821	995061	995355	995987	Seq. ID No. 3822
1830b	Seq. ID No. 3823	995061	995127	995987	Seq. ID No. 3824
1833	Seq. ID No. 3825	996148	996148	997719	Seq. ID No. 3826

TABLE 2: ALL CLAIMED ORFS

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1834	Seq. ID No. 3827	998067	998067	997864	Seq. ID No. 3828
1835	Seq. ID No. 3829	998280	998280	998462	Seq. ID No. 3830
1836a	Seq. ID No. 3831	998407	998452	999252	Seq. ID No. 3832
1836b	Seq. ID No. 3833	998407	998437	999252	Seq. ID No. 3834
1837	Seq. ID No. 3835	999249	999264	999962	Seq. ID No. 3836
1838a	Seq. ID No. 3837	999984	1000437	1001729	Seq. ID No. 3838
1838b	Seq. ID No. 3839	999984	1000410	1001729	Seq. ID No. 3840
1838c	Seq. ID No. 3841	999984	1000026	1001729	Seq. ID No. 3842
1838d	Seq. ID No. 3843	999984	999993	1001729	Seq. ID No. 3844
1839a	Seq. ID No. 3845	1001786	1001882	1002862	Seq. ID No. 3846
1839b	Seq. ID No. 3847	1001786	1001852	1002862	Seq. ID No. 3848
1842a	Seq. ID No. 3849	1003007	1004168	1004401	Seq. ID No. 3850
1842b	Seq. ID No. 3851	1003007	1003763	1004401	Seq. ID No. 3852
1842c	Seq. ID No. 3853	1003007	1003511	1004401	Seq. ID No. 3854
1842d	Seq. ID No. 3855	1003007	1003013	1004401	Seq. ID No. 3856
1843	Seq. ID No. 3857	1004418	1004421	1005749	Seq. ID No. 3858
1845a	Seq. ID No. 3859	1008055	1007122	1006469	Seq. ID No. 3860
1845b	Seq. ID No. 3861	1008055	1007620	1006469	Seq. ID No. 3862
1845c	Seq. ID No. 3863	1008055	1008037	1006469	Seq. ID No. 3864
1848a	Seq. ID No. 3865	1009315	1009012	1008188	Seq. ID No. 3866
1848b	Seq. ID No. 3867	1009315	1009315	1008188	Seq. ID No. 3868
1850a	Seq. ID No. 3869	1009477	1009501	1010796	Seq. ID No. 3870
1850b	Seq. ID No. 3871	1009477	1009495	1010796	Seq. ID No. 3872
1850c	Seq. ID No. 3873	1009477	1009486	1010796	Seq. ID No. 3874
1853a	Seq. ID No. 3875	1010827	1010860	1011777	Seq. ID No. 3876
1853b	Seq. ID No. 3877	1010827	1010830	1011777	Seq. ID No. 3878
1854a	Seq. ID No. 3879	1011872	1011941	1012564	Seq. ID No. 3880
1854b	Seq. ID No. 3881	1011872	1011875	1012564	Seq. ID No. 3882
1855	Seq. ID No. 3883	1012793	1012808	1013707	Seq. ID No. 3884

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1856	Seq. ID No. 3885	1013934	1014024	1014491	Seq. ID No. 3886
1857a	Seq. ID No. 3887	1016563	1015273	1014593	Seq. ID No. 3888
1857b	Seq. ID No. 3889	1016563	1016080	1014593	Seq. ID No. 3890
1857c	Seq. ID No. 3891	1016563	1016137	1014593	Seq. ID No. 3892
1857d	Seq. ID No. 3893	1016563	1016536	1014593	Seq. ID No. 3894
1858	Seq. ID No. 3895	1015131	1015131	1014907	Seq. ID No. 3896
1859	Seq. ID No. 3897	1016974	1016971	1016564	Seq. ID No. 3898
1861a	Seq. ID No. 3899	1017158	1017200	1019077	Seq. ID No. 3900
1861b	Seq. ID No. 3901	1017158	1017173	1019077	Seq. ID No. 3902
1862a	Seq. ID No. 3903	1019736	1019589	1019356	Seq. ID No. 3904
1863a	Seq. ID No. 3905	1019023	1019089	1019583	Seq. ID No. 3906
1863b	Seq. ID No. 3907	1019023	1019050	1019583	Seq. ID No. 3908
1864a	Seq. ID No. 3909	1019384	1019564	1019725	Seq. ID No. 3910
1865a	Seq. ID No. 3911	1020661	1020484	1019975	Seq. ID No. 3912
1865b	Seq. ID No. 3913	1020661	1020583	1019975	Seq. ID No. 3914
1868	Seq. ID No. 3915	1020702	1020720	1021364	Seq. ID No. 3916
1869	Seq. ID No. 3917	1021387	1021423	1021665	Seq. ID No. 3918
1870	Seq. ID No. 3919	1021696	1021726	1022442	Seq. ID No. 3920
1873a	Seq. ID No. 3921	1022670	1022817	1024157	Seq. ID No. 3922
1873b	Seq. ID No. 3923	1022670	1022691	1024157	Seq. ID No. 3924
1873c	Seq. ID No. 3925	1022670	1022685	1024157	Seq. ID No. 3926
1875b	Seq. ID No. 3927	1024158	1024332	1024784	Seq. ID No. 3928
1875c	Seq. ID No. 3929	1024158	1024176	1024784	Seq. ID No. 3930
1877a	Seq. ID No. 3931	1024785	1024875	1025720	Seq. ID No. 3932
1877b	Seq. ID No. 3933	1024785	1024839	1025720	Seq. ID No. 3934
1878	Seq. ID No. 3935	1025721	1025727	1026500	Seq. ID No. 3936
1879	Seq. ID No. 3937	1026737	1026746	1027618	Seq. ID No. 3938
1882	Seq. ID No. 3939	1029775	1029730	1029149	Seq. ID No. 3940
1884	Seq. ID No. 3941	1027658	1027664	1029772	Seq. ID No. 3942



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1886	Seq. ID No. 3943	1030310	1030322	1031617	Seq. ID No. 3944
1887	Seq. ID No. 3945	1032244	1032274	1033614	Seq. ID No. 3946
1888a	Seq. ID No. 3947	1033590	1033638	1034795	Seq. ID No. 3948
1888b	Seq. ID No. 3949	1033590	1033605	1034795	Seq. ID No. 3950
1890	Seq. ID No. 3951	1035321	1035333	1036628	Seq. ID No. 3952
1891a	Seq. ID No. 3953	1036778	1036790	1037686	Seq. ID No. 3954
1891b	Seq. ID No. 3955	1036778	1036781	1037686	Seq. ID No. 3956
1893	Seq. ID No. 3957	1037696	1037708	1038250	Seq. ID No. 3958
1894c	Seq. ID No. 3959	1039058	1039037	1038525	Seq. ID No. 3960
1895	Seq. ID No. 3961	1039206	1039179	1038955	Seq. ID No. 3962
1896a	Seq. ID No. 3963	1039673	1039535	1039275	Seq. ID No. 3964
1896b	Seq. ID No. 3965	1039673	1039670	1039275	Seq. ID No. 3966
1897a	Seq. ID No. 3967	1038235	1038385	1039677	Seq. ID No. 3968
1897b	Seq. ID No. 3969	1038235	1038367	1039677	Seq. ID No. 3970
1897c	Seq. ID No. 3971	1038235	1038247	1039677	Seq. ID No. 3972
1898a	Seq. ID No. 3973	1040455	1040092	1039814	Seq. ID No. 3974
1898b	Seq. ID No. 3975	1040455	1040443	1039814	Seq. ID No. 3976
1899	Seq. ID No. 3977	1039856	1039856	1039984	Seq. ID No. 3978
1900	Seq. ID No. 3979	1040697	1040739	1041041	Seq. ID No. 3980
1902a	Seq. ID No. 3981	1040639	1040720	1042606	Seq. ID No. 3982
1902b	Seq. ID No. 3983	1040639	1040645	1042606	Seq. ID No. 3984
1907	Seq. ID No. 3985	1042729	1042732	1045191	Seq. ID No. 3986
1912	Seq. ID No. 3987	1045328	1045331	1047583	Seq. ID No. 3988
1915a	Seq. ID No. 3989	1047614	1047626	1048372	Seq. ID No. 3990
1915b	Seq. ID No. 3991	1047614	1047620	1048372	Seq. ID No. 3992
1916	Seq. ID No. 3993	1048741	1048741	1048932	Seq. ID No. 3994
1917a	Seq. ID No. 3995	1049809	1049785	1049450	Seq. ID No. 3996
1917b	Seq. ID No. 3997	1049809	1049806	1049450	Seq. ID No. 3998
1918b	Seq. ID No. 3999	1049037	1049160	1049855	Seq. ID No. 4000

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1918c	Seq. ID No. 4001	1049037	1049073	1049855	Seq. ID No. 4002
1918d	Seq. ID No. 4003	1049037	1049058	1049855	Seq. ID No. 4004
1919a	Seq. ID No. 4005	1050015	1050093	1050395	Seq. ID No. 4006
1919b	Seq. ID No. 4007	1050015	1050060	1050395	Seq. ID No. 4008
1919c	Seq. ID No. 4009	1050015	1050033	1050395	Seq. ID No. 4010
1923a	Seq. ID No. 4011	1050906	1050942	1051274	Seq. ID No. 4012
1923b	Seq. ID No. 4013	1050906	1050921	1051274	Seq. ID No. 4014
1925	Seq. ID No. 4015	1051259	1051301	1053043	Seq. ID No. 4016
1926	Seq. ID No. 4017	1056054	1056039	1053739	Seq. ID No. 4018
1927a	Seq. ID No. 4019	1057220	1056728	1056186	Seq. ID No. 4020
1927b	Seq. ID No. 4021	1057220	1057217	1056186	Seq. ID No. 4022
1930	Seq. ID No. 4023	1057377	1057383	1058411	Seq. ID No. 4024
1931a	Seq. ID No. 4025	1059508	1058830	1058501	Seq. ID No. 4026
1931b	Seq. ID No. 4027	1059508	1058938	1058501	Seq. ID No. 4028
1931c	Seq. ID No. 4029	1059508	1059370	1058501	Seq. ID No. 4030
1932	Seq. ID No. 4031	1059744	1059726	1059454	Seq. ID No. 4032
1933a	Seq. ID No. 4033	1060398	1060266	1059748	Seq. ID No. 4034
1933b	Seq. ID No. 4035	1060398	1060398	1059748	Seq. ID No. 4036
1934	Seq. ID No. 4037	1061142	1061124	1060399	Seq. ID No. 4038
1936	Seq. ID No. 4039	1062327	1062327	1061245	Seq. ID No. 4040
1937a	Seq. ID No. 4041	1063629	1062585	1062328	Seq. ID No. 4042
1937b	Seq. ID No. 4043	1063629	1062750	1062328	Seq. ID No. 4044
1937c	Seq. ID No. 4045	1063629	1062804	1062328	Seq. ID No. 4046
1937d	Seq. ID No. 4047	1063629	1063587	1062328	Seq. ID No. 4048
1937e	Seq. ID No. 4049	1063629	1063596	1062328	Seq. ID No. 4050
1939a	Seq. ID No. 4051	1064617	1064539	1063607	Seq. ID No. 4052
1939b	Seq. ID No. 4053	1064617	1064596	1063607	Seq. ID No. 4054
1939c	Seq. ID No. 4055	1064617	1064614	1063607	Seq. ID No. 4056
1940	Seq. ID No. 4057	1065300	1065288	1064641	Seq. ID No. 4058

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1941a	Seq. ID No. 4059	1066411	1066216	1065281	Seq. ID No. 4060
1941b	Seq. ID No. 4061	1066411	1066393	1065281	Seq. ID No. 4062
1942	Seq. ID No. 4063	1067113	1067026	1066649	Seq. ID No. 4064
1943a	Seq. ID No. 4065	1067802	1067511	1067122	Seq. ID No. 4066
1943b	Seq. ID No. 4067	1067802	1067544	1067122	Seq. ID No. 4068
1944	Seq. ID No. 4069	1067921	1067873	1067535	Seq. ID No. 4070
1946a	Seq. ID No. 4071	1069576	1068571	1068113	Seq. ID No. 4072
1946b	Seq. ID No. 4073	1069576	1069309	1068113	Seq. ID No. 4074
1946c	Seq. ID No. 4075	1069576	1069570	1068113	Seq. ID No. 4076
1949	Seq. ID No. 4077	1069969	1069969	1069706	Seq. ID No. 4078
1950	Seq. ID No. 4079	1070524	1070500	1069970	Seq. ID No. 4080
1951a	Seq. ID No. 4081	1072333	1072153	1070546	Seq. ID No. 4082
1951b	Seq. ID No. 4083	1072333	1072267	1070546	Seq. ID No. 4084
1951c	Seq. ID No. 4085	1072333	1072279	1070546	Seq. ID No. 4086
1951d	Seq. ID No. 4087	1072333	1072321	1070546	Seq. ID No. 4088
1953	Seq. ID No. 4089	1073298	1073298	1072453	Seq. ID No. 4090
1954a	Seq. ID No. 4091	1074218	1074092	1073424	Seq. ID No. 4092
1954b	Seq. ID No. 4093	1074218	1074155	1073424	Seq. ID No. 4094
1954c	Seq. ID No. 4095	1074218	1074167	1073424	Seq. ID No. 4096
1956	Seq. ID No. 4097	1074927	1074882	1074442	Seq. ID No. 4098
1957	Seq. ID No. 4099	1075766	1075754	1074945	Seq. ID No. 4100
1958a	Seq. ID No. 4101	1076688	1076142	1075747	Seq. ID No. 4102
1958b	Seq. ID No. 4103	1076688	1076502	1075747	Seq. ID No. 4104
1958c	Seq. ID No. 4105	1076688	1076646	1075747	Seq. ID No. 4106
1960a	Seq. ID No. 4107	1077650	1077386	1076643	Seq. ID No. 4108
1960b	Seq. ID No. 4109	1077650	1077530	1076643	Seq. ID No. 4110
1960c	Seq. ID No. 4111	1077650	1077635	1076643	Seq. ID No. 4112
1961	Seq. ID No. 4113	1076360	1076369	1076734	Seq. ID No. 4114
1962a	Seq. ID No. 4115	1079051	1079006	1077744	Seq. ID No. 4116

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1962b	Seq. ID No. 4117	1079051	1079039	1077744	Seq. ID No. 4118
1965a	Seq. ID No. 4119	1080385	1080358	1079804	Seq. ID No. 4120
1965b	Seq. ID No. 4121	1080385	1080367	1079804	Seq. ID No. 4122
1966	Seq. ID No. 4123	1080971	1080932	1080441	Seq. ID No. 4124
1967	Seq. ID No. 4125	1081519	1081510	1081103	Seq. ID No. 4126
1968	Seq. ID No. 4127	1082563	1082482	1081568	Seq. ID No. 4128
1969	Seq. ID No. 4129	1082949	1082946	1082479	Seq. ID No. 4130
1970a	Seq. ID No. 4131	1083034	1083196	1083726	Seq. ID No. 4132
1970b	Seq. ID No. 4133	1083034	1083067	1083726	Seq. ID No. 4134
1972	Seq. ID No. 4135	1084033	1084045	1084338	Seq. ID No. 4136
1973	Seq. ID No. 4137	1083717	1083723	1084562	Seq. ID No. 4138
1976	Seq. ID No. 4139	1085958	1085958	1085671	Seq. ID No. 4140
1977a	Seq. ID No. 4141	1084534	1084552	1085925	Seq. ID No. 4142
1977b	Seq. ID No. 4143	1084534	1084540	1085925	Seq. ID No. 4144
1977c	Seq. ID No. 4145	1084534	1084534	1085925	Seq. ID No. 4146
1979a	Seq. ID No. 4147	1090104	1089960	1086301	Seq. ID No. 4148
1979b	Seq. ID No. 4149	1090104	1090077	1086301	Seq. ID No. 4150
1980a	Seq. ID No. 4151	1088858	1088837	1088577	Seq. ID No. 4152
1980b	Seq. ID No. 4153	1088858	1088855	1088577	Seq. ID No. 4154
1981	Seq. ID No. 4155	1089710	1089743	1090015	Seq. ID No. 4156
1982	Seq. ID No. 4157	1093702	1093678	1090049	Seq. ID No. 4158
1985a	Seq. ID No. 4159	1095093	1094937	1093696	Seq. ID No. 4160
1985b	Seq. ID No. 4161	1095093	1095036	1093696	Seq. ID No. 4162
1986	Seq. ID No. 4163	1096130	1096085	1094955	Seq. ID No. 4164
1987a	Seq. ID No. 4165	1096803	1096599	1096072	Seq. ID No. 4166
1987b	Seq. ID No. 4167	1096803	1096779	1096072	Seq. ID No. 4168
1989a	Seq. ID No. 4169	1097597	1097564	1096920	Seq. ID No. 4170
1989b	Seq. ID No. 4171	1097597	1097585	1096920	Seq. ID No. 4172
1989c	Seq. ID No. 4173	1097597	1097588	1096920	Seq. ID No. 4174

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
1990a	Seq. ID No. 4175	1098801	1098660	1097689	Seq. ID No. 4176
1990b	Seq. ID No. 4177	1098801	1098744	1097689	Seq. ID No. 4178
1990c	Seq. ID No. 4179	1098801	1098798	1097689	Seq. ID No. 4180
1991	Seq. ID No. 4181	1098269	1098332	1098715	Seq. ID No. 4182
1992a	Seq. ID No. 4183	1100670	1100409	1098817	Seq. ID No. 4184
1992b	Seq. ID No. 4185	1100670	1100670	1098817	Seq. ID No. 4186
1993a	Seq. ID No. 4187	1103997	1103709	1100698	Seq. ID No. 4188
1993b	Seq. ID No. 4189	1103997	1103943	1100698	Seq. ID No. 4190
1993c	Seq. ID No. 4191	1103997	1103985	1100698	Seq. ID No. 4192
1996	Seq. ID No. 4193	1106269	1106263	1104185	Seq. ID No. 4194
2000	Seq. ID No. 4195	1107254	1107176	1106244	Seq. ID No. 4196
2001	Seq. ID No. 4197	1108224	1108203	1107433	Seq. ID No. 4198
2003	Seq. ID No. 4199	1109198	1109144	1108212	Seq. ID No. 4200
2006	Seq. ID No. 4201	1109556	1109550	1109131	Seq. ID No. 4202
2008	Seq. ID No. 4203	1109960	1109942	1109565	Seq. ID No. 4204
2010	Seq. ID No. 4205	1110423	1110420	1109926	Seq. ID No. 4206
2011a	Seq. ID No. 4207	1111515	1111290	1110424	Seq. ID No. 4208
2011b	Seq. ID No. 4209	1111515	1111335	1110424	Seq. ID No. 4210
2011c	Seq. ID No. 4211	1111515	1111476	1110424	Seq. ID No. 4212
2013a	Seq. ID No. 4213	1112031	1111983	1111570	Seq. ID No. 4214
2013b	Seq. ID No. 4215	1112031	1112013	1111570	Seq. ID No. 4216
2014c	Seq. ID No. 4217	1112923	1112905	1112459	Seq. ID No. 4218
2015	Seq. ID No. 4219	1112955	1112988	1113797	Seq. ID No. 4220
2016a	Seq. ID No. 4221	1115435	1114151	1113879	Seq. ID No. 4222
2016b	Seq. ID No. 4223	1115435	1114319	1113879	Seq. ID No. 4224
2016c	Seq. ID No. 4225	1115435	1114655	1113879	Seq. ID No. 4226
2016d	Seq. ID No. 4227	1115435	1115117	1113879	Seq. ID No. 4228
2016e	Seq. ID No. 4229	1115435	1115213	1113879	Seq. ID No. 4230
2016f	Seq. ID No. 4231	1115435	1115306	1113879	Seq. ID No. 4232

TABLE 2: ALL CLAIMED ORFS

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2016g	Seq. ID No. 4233	1115435	1115360	1113879	Seq. ID No. 4234
2016h	Seq. ID No. 4235	1115435	1115390	1113879	Seq. ID No. 4236
2020	Seq. ID No. 4237	1115867	1115864	1115451	Seq. ID No. 4238
2021	Seq. ID No. 4239	1116881	1116842	1115868	Seq. ID No. 4240
2023a	Seq. ID No. 4241	1117636	1117222	1116860	Seq. ID No. 4242
2023b	Seq. ID No. 4243	1117636	1117546	1116860	Seq. ID No. 4244
2024a	Seq. ID No. 4245	1120274	1120019	1117974	Seq. ID No. 4246
2024b	Seq. ID No. 4247	1120274	1120139	1117974	Seq. ID No. 4248
2024c	Seq. ID No. 4249	1120274	1120199	1117974	Seq. ID No. 4250
2024d	Seq. ID No. 4251	1120274	1120241	1117974	Seq. ID No. 4252
2025	Seq. ID No. 4253	1117941	1117962	1118285	Seq. ID No. 4254
2027	Seq. ID No. 4255	1120944	1120941	1120333	Seq. ID No. 4256
2030a	Seq. ID No. 4257	1121092	1121569	1121886	Seq. ID No. 4258
2030b	Seq. ID No. 4259	1121092	1121170	1121886	Seq. ID No. 4260
2030c	Seq. ID No. 4261	1121092	1121146	1121886	Seq. ID No. 4262
2030d	Seq. ID No. 4263	1121092	1121110	1121886	Seq. ID No. 4264
2032c	Seq. ID No. 4265	1122301	1122400	1122681	Seq. ID No. 4266
2033	Seq. ID No. 4267	1121958	1121985	1122926	Seq. ID No. 4268
2035b	Seq. ID No. 4269	1124479	1124464	1124108	Seq. ID No. 4270
2036	Seq. ID No. 4271	1123137	1123161	1124852	Seq. ID No. 4272
2037	Seq. ID No. 4273	1126339	1126327	1125326	Seq. ID No. 4274
2038a	Seq. ID No. 4275	1126251	1126158	1125856	Seq. ID No. 4276
2040a	Seq. ID No. 4277	1125890	1125932	1126255	Seq. ID No. 4278
2042	Seq. ID No. 4279	1126698	1126698	1127249	Seq. ID No. 4280
2043b	Seq. ID No. 4281	1127254	1127254	1128054	Seq. ID No. 4282
2044	Seq. ID No. 4283	1129041	1129041	1128340	Seq. ID No. 4284
2045a	Seq. ID No. 4285	1128368	1128383	1128649	Seq. ID No. 4286
2045b	Seq. ID No. 4287	1128368	1128371	1128649	Seq. ID No. 4288
2046a	Seq. ID No. 4289	1130349	1130322	1129096	Seq. ID No. 4290

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2046b	Seq. ID No. 4291	1130349	1130349	1129096	Seq. ID No. 4292
2047a	Seq. ID No. 4293	1131789	1131750	1130452	Seq. ID No. 4294
2047b	Seq. ID No. 4295	1131789	1131762	1130452	Seq. ID No. 4296
2049c	Seq. ID No. 4297	1132248	1132347	1132628	Seq. ID No. 4298
2050	Seq. ID No. 4299	1131905	1131932	1132873	Seq. ID No. 4300
2053	Seq. ID No. 4301	1133117	1133117	1134556	Seq. ID No. 4302
2054	Seq. ID No. 4303	1135143	1135140	1134631	Seq. ID No. 4304
2055	Seq. ID No. 4305	1135139	1135139	1135279	Seq. ID No. 4306
2056	Seq. ID No. 4307	1135786	1135771	1135430	Seq. ID No. 4308
2057	Seq. ID No. 4309	1137026	1137020	1135758	Seq. ID No. 4310
2059a	Seq. ID No. 4311	1137134	1137374	1138240	Seq. ID No. 4312
2059b	Seq. ID No. 4313	1137134	1137140	1138240	Seq. ID No. 4314
2060a	Seq. ID No. 4315	1138968	1138920	1138384	Seq. ID No. 4316
2060b	Seq. ID No. 4317	1138968	1138962	1138384	Seq. ID No. 4318
2062a	Seq. ID No. 4319	1140218	1140038	1139013	Seq. ID No. 4320
2062b	Seq. ID No. 4321	1140218	1140119	1139013	Seq. ID No. 4322
2062c	Seq. ID No. 4323	1140218	1140200	1139013	Seq. ID No. 4324
2064	Seq. ID No. 4325	1141198	1141186	1140200	Seq. ID No. 4326
2065a	Seq. ID No. 4327	1142468	1142435	1141179	Seq. ID No. 4328
2065b	Seq. ID No. 4329	1142468	1142465	1141179	Seq. ID No. 4330
2066	Seq. ID No. 4331	1143393	1143375	1142428	Seq. ID No. 4332
2068	Seq. ID No. 4333	1145373	1145277	1143484	Seq. ID No. 4334
2069a	Seq. ID No. 4335	1146734	1146590	1145292	Seq. ID No. 4336
2069b	Seq. ID No. 4337	1146734	1146608	1145292	Seq. ID No. 4338
2069c	Seq. ID No. 4339	1146734	1146662	1145292	Seq. ID No. 4340
2074a	Seq. ID No. 4341	1147059	1147179	1148387	Seq. ID No. 4342
2074b	Seq. ID No. 4343	1147059	1147074	1148387	Seq. ID No. 4344
2075a	Seq. ID No. 4345	1149029	1148891	1148439	Seq. ID No. 4346
2075b	Seq. ID No. 4347	1149029	1148894	1148439	Seq. ID No. 4348

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2076a	Seq. ID No. 4349	1151134	1151065	1148912	Seq. ID No. 4350
2076b	Seq. ID No. 4351	1151134	1151122	1148912	Seq. ID No. 4352
2076c	Seq. ID No. 4353	1151134	1151131	1148912	Seq. ID No. 4354
2078	Seq. ID No. 4355	1151921	1151906	1151253	Seq. ID No. 4356
2079a	Seq. ID No. 4357	1152998	1152887	1151922	Seq. ID No. 4358
2079b	Seq. ID No. 4359	1152998	1152926	1151922	Seq. ID No. 4360
2079c	Seq. ID No. 4361	1152998	1152989	1151922	Seq. ID No. 4362
2081a	Seq. ID No. 4363	1153482	1153383	1152865	Seq. ID No. 4364
2081b	Seq. ID No. 4365	1153482	1153419	1152865	Seq. ID No. 4366
2086a	Seq. ID No. 4367	1153561	1153570	1154904	Seq. ID No. 4368
2086b	Seq. ID No. 4369	1153561	1153561	1154904	Seq. ID No. 4370
2087a	Seq. ID No. 4371	1154925	1154952	1155377	Seq. ID No. 4372
2087b	Seq. ID No. 4373	1154925	1154934	1155377	Seq. ID No. 4374
2088	Seq. ID No. 4375	1156149	1156134	1155403	Seq. ID No. 4376
2091	Seq. ID No. 4377	1156470	1156494	1157174	Seq. ID No. 4378
2092	Seq. ID No. 4379	1157162	1157174	1157866	Seq. ID No. 4380
2093a	Seq. ID No. 4381	1157784	1157838	1158065	Seq. ID No. 4382
2094	Seq. ID No. 4383	1158149	1158164	1158913	Seq. ID No. 4384
2096a	Seq. ID No. 4385	1158888	1159740	1160903	Seq. ID No. 4386
2096b	Seq. ID No. 4387	1158888	1159086	1160903	Seq. ID No. 4388
2096c	Seq. ID No. 4389	1158888	1158915	1160903	Seq. ID No. 4390
2096d	Seq. ID No. 4391	1158888	1158906	1160903	Seq. ID No. 4392
2097	Seq. ID No. 4393	1163111	1163090	1161267	Seq. ID No. 4394
2098b	Seq. ID No. 4395	1161405	1161474	1161959	Seq. ID No. 4396
2100	Seq. ID No. 4397	1164393	1164378	1163221	Seq. ID No. 4398
2101	Seq. ID No. 4399	1164206	1164203	1163817	Seq. ID No. 4400
2104	Seq. ID No. 4401	1166334	1166304	1164466	Seq. ID No. 4402
2105	Seq. ID No. 4403	1164590	1164728	1164985	Seq. ID No. 4404
2107a	Seq. ID No. 4405	1164986	1165082	1165558	Seq. ID No. 4406



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2107b	Seq. ID No. 4407	1164986	1165040	1165558	Seq. ID No. 4408
2109a	Seq. ID No. 4409	1166983	1166947	1166375	Seq. ID No. 4410
2109b	Seq. ID No. 4411	1166983	1166968	1166375	Seq. ID No. 4412
2110a	Seq. ID No. 4413	1168054	1168024	1166984	Seq. ID No. 4414
2110b	Seq. ID No. 4415	1168054	1168045	1166984	Seq. ID No. 4416
2110c	Seq. ID No. 4417	1168054	1168048	1166984	Seq. ID No. 4418
2112a	Seq. ID No. 4419	1169192	1168997	1168212	Seq. ID No. 4420
2112b	Seq. ID No. 4421	1169192	1169051	1168212	Seq. ID No. 4422
2112c	Seq. ID No. 4423	1169192	1169159	1168212	Seq. ID No. 4424
2114b	Seq. ID No. 4425	1168308	1168356	1168880	Seq. ID No. 4426
2115a	Seq. ID No. 4427	1170166	1170046	1169168	Seq. ID No. 4428
2115b	Seq. ID No. 4429	1170166	1170091	1169168	Seq. ID No. 4430
2115c	Seq. ID No. 4431	1170166	1170157	1169168	Seq. ID No. 4432
2116	Seq. ID No. 4433	1170571	1170541	1170185	Seq. ID No. 4434
2117	Seq. ID No. 4435	1172931	1172919	1170559	Seq. ID No. 4436
2120a	Seq. ID No. 4437	1170911	1170998	1171270	Seq. ID No. 4438
2120b	Seq. ID No. 4439	1170911	1170983	1171270	Seq. ID No. 4440
2122b	Seq. ID No. 4441	1172314	1172344	1172679	Seq. ID No. 4442
2123	Seq. ID No. 4443	1173237	1173237	1172935	Seq. ID No. 4444
2124a	Seq. ID No. 4445	1173535	1173502	1173227	Seq. ID No. 4446
2124b	Seq. ID No. 4447	1173535	1173523	1173227	Seq. ID No. 4448
2125a	Seq. ID No. 4449	1174978	1174948	1173578	Seq. ID No. 4450
2125b	Seq. ID No. 4451	1174978	1174975	1173578	Seq. ID No. 4452
2127a	Seq. ID No. 4453	1174343	1174370	1174894	Seq. ID No. 4454
2127b	Seq. ID No. 4455	1174343	1174349	1174894	Seq. ID No. 4456
2128a	Seq. ID No. 4457	1175492	1175444	1174965	Seq. ID No. 4458
2128b	Seq. ID No. 4459	1175492	1175456	1174965	Seq. ID No. 4460
2133	Seq. ID No. 4461	1179995	1179938	1175604	Seq. ID No. 4462
2138a	Seq. ID No. 4463	1181752	1181653	1180022	Seq. ID No. 4464

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2138b	Seq. ID No. 4465	1181752	1181728	1180022	Seq. ID No. 4466
2138c	Seq. ID No. 4467	1181752	1181737	1180022	Seq. ID No. 4468
2140a	Seq. ID No. 4469	1183087	1182526	1181753	Seq. ID No. 4470
2140b	Seq. ID No. 4471	1183087	1183021	1181753	Seq. ID No. 4472
2142a	Seq. ID No. 4473	1183896	1183278	1183039	Seq. ID No. 4474
2142b	Seq. ID No. 4475	1183896	1183833	1183039	Seq. ID No. 4476
2144a	Seq. ID No. 4477	1184612	1184585	1183848	Seq. ID No. 4478
2144b	Seq. ID No. 4479	1184612	1184603	1183848	Seq. ID No. 4480
2146	Seq. ID No. 4481	1185730	1185712	1184780	Seq. ID No. 4482
2147a	Seq. ID No. 4483	1186442	1185977	1185735	Seq. ID No. 4484
2147b	Seq. ID No. 4485	1186442	1186334	1185735	Seq. ID No. 4486
2147c	Seq. ID No. 4487	1186442	1186436	1185735	Seq. ID No. 4488
2149a	Seq. ID No. 4489	1187547	1187235	1186429	Seq. ID No. 4490
2149b	Seq. ID No. 4491	1187547	1187448	1186429	Seq. ID No. 4492
2150a	Seq. ID No. 4493	1186646	1186742	1187041	Seq. ID No. 4494
2150b	Seq. ID No. 4495	1186646	1186736	1187041	Seq. ID No. 4496
2150c	Seq. ID No. 4497	1186646	1186703	1187041	Seq. ID No. 4498
2152a	Seq. ID No. 4499	1188368	1188338	1188096	Seq. ID No. 4500
2153	Seq. ID No. 4501	1189235	1189223	1188666	Seq. ID No. 4502
2155a	Seq. ID No. 4503	1189980	1189947	1189216	Seq. ID No. 4504
2155b	Seq. ID No. 4505	1189980	1189965	1189216	Seq. ID No. 4506
2156a	Seq. ID No. 4507	1190977	1190908	1190087	Seq. ID No. 4508
2156b	Seq. ID No. 4509	1190977	1190941	1190087	Seq. ID No. 4510
2156c	Seq. ID No. 4511	1190977	1190965	1190087	Seq. ID No. 4512
2159a	Seq. ID No. 4513	1190613	1190619	1190945	Seq. ID No. 4514
2159b	Seq. ID No. 4515	1190613	1190616	1190945	Seq. ID No. 4516
2160a	Seq. ID No. 4517	1191908	1191713	1191027	Seq. ID No. 4518
2160b	Seq. ID No. 4519	1191908	1191791	1191027	Seq. ID No. 4520
2160c	Seq. ID No. 4521	1191908	1191845	1191027	Seq. ID No. 4522

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2160d	Seq. ID No. 4523	1191908	1191872	1191027	Seq. ID No. 4524
2161a	Seq. ID No. 4525	1190995	1191142	1191522	Seq. ID No. 4526
2161b	Seq. ID No. 4527	1190995	1191037	1191522	Seq. ID No. 4528
2161c	Seq. ID No. 4529	1190995	1191001	1191522	Seq. ID No. 4530
2164	Seq. ID No. 4531	1191988	1192009	1192626	Seq. ID No. 4532
2165	Seq. ID No. 4533	1192933	1192903	1192676	Seq. ID No. 4534
2166a	Seq. ID No. 4535	1194996	1194612	1193065	Seq. ID No. 4536
2166b	Seq. ID No. 4537	1194996	1194993	1193065	Seq. ID No. 4538
2169	Seq. ID No. 4539	1195265	1195253	1195011	Seq. ID No. 4540
2171	Seq. ID No. 4541	1195373	1195388	1196059	Seq. ID No. 4542
2172	Seq. ID No. 4543	1196128	1196143	1196508	Seq. ID No. 4544
2173a	Seq. ID No. 4545	1197663	1197603	1196563	Seq. ID No. 4546
2173b	Seq. ID No. 4547	1197663	1197618	1196563	Seq. ID No. 4548
2174	Seq. ID No. 4549	1198165	1198165	1197650	Seq. ID No. 4550
2175	Seq. ID No. 4551	1197212	1197287	1197667	Seq. ID No. 4552
2176a	Seq. ID No. 4553	1200498	1200012	1198177	Seq. ID No. 4554
2176b	Seq. ID No. 4555	1200498	1200204	1198177	Seq. ID No. 4556
2176c	Seq. ID No. 4557	1200498	1200297	1198177	Seq. ID No. 4558
2176d	Seq. ID No. 4559	1200498	1200480	1198177	Seq. ID No. 4560
2177b	Seq. ID No. 4561	1199045	1199054	1199458	Seq. ID No. 4562
2179a	Seq. ID No. 4563	1201338	1201272	1200499	Seq. ID No. 4564
2179b	Seq. ID No. 4565	1201338	1201329	1200499	Seq. ID No. 4566
2180	Seq. ID No. 4567	1202280	1202268	1201339	Seq. ID No. 4568
2181a	Seq. ID No. 4569	1203606	1203582	1202281	Seq. ID No. 4570
2181b	Seq. ID No. 4571	1203606	1203588	1202281	Seq. ID No. 4572
2182	Seq. ID No. 4573	1203089	1203110	1203406	Seq. ID No. 4574
2183	Seq. ID No. 4575	1204620	1204614	1203607	Seq. ID No. 4576
2185	Seq. ID No. 4577	1205219	1205216	1204611	Seq. ID No. 4578
2186a	Seq. ID No. 4579	1206643	1206499	1205366	Seq. ID No. 4580

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2186b	Seq. ID No. 4581	1206643	1206634	1205366	Seq. ID No. 4582
2189a	Seq. ID No. 4583	1208090	1207934	1206753	Seq. ID No. 4584
2189b	Seq. ID No. 4585	1208090	1208090	1206753	Seq. ID No. 4586
2190a	Seq. ID No. 4587	1206664	1206916	1207176	Seq. ID No. 4588
2190b	Seq. ID No. 4589	1206664	1206700	1207176	Seq. ID No. 4590
2193	Seq. ID No. 4591	1209177	1209138	1208200	Seq. ID No. 4592
2194a	Seq. ID No. 4593	1209651	1209582	1209211	Seq. ID No. 4594
2194c	Seq. ID No. 4595	1209651	1209600	1209211	Seq. ID No. 4596
2196	Seq. ID No. 4597	1210624	1210606	1209737	Seq. ID No. 4598
2197a	Seq. ID No. 4599	1213676	1212611	1210572	Seq. ID No. 4600
2197b	Seq. ID No. 4601	1213676	1213463	1210572	Seq. ID No. 4602
2197c	Seq. ID No. 4603	1213676	1213610	1210572	Seq. ID No. 4604
2201a	Seq. ID No. 4605	1215054	1214976	1214029	Seq. ID No. 4606
2201b	Seq. ID No. 4607	1215054	1214991	1214029	Seq. ID No. 4608
2203	Seq. ID No. 4609	1215377	1215341	1215063	Seq. ID No. 4610
2204	Seq. ID No. 4611	1216828	1216804	1215491	Seq. ID No. 4612
2206a	Seq. ID No. 4613	1218208	1218172	1216907	Seq. ID No. 4614
2206b	Seq. ID No. 4615	1218208	1218190	1216907	Seq. ID No. 4616
2208a	Seq. ID No. 4617	1217688	1217814	1218146	Seq. ID No. 4618
2208b	Seq. ID No. 4619	1217688	1217691	1218146	Seq. ID No. 4620
2208c	Seq. ID No. 4621	1217688	1217688	1218146	Seq. ID No. 4622
2209	Seq. ID No. 4623	1218957	1218957	1218280	Seq. ID No. 4624
2212a	Seq. ID No. 4625	1219686	1219626	1218958	Seq. ID No. 4626
2212b	Seq. ID No. 4627	1219686	1219662	1218958	Seq. ID No. 4628
2215a	Seq. ID No. 4629	1221266	1220597	1219668	Seq. ID No. 4630
2215b	Seq. ID No. 4631	1221266	1221101	1219668	Seq. ID No. 4632
2216a	Seq. ID No. 4633	1221658	1221358	1221098	Seq. ID No. 4634
2216b	Seq. ID No. 4635	1221658	1221532	1221098	Seq. ID No. 4636
2218	Seq. ID No. 4637	1222155	1222137	1221580	Seq. ID No. 4638

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2219a	Seq. ID No. 4639	1222926	1222596	1222252	Seq. ID No. 4640
2219b	Seq. ID No. 4641	1222926	1222881	1222252	Seq. ID No. 4642
2219c	Seq. ID No. 4643	1222926	1222920	1222252	Seq. ID No. 4644
2220a	Seq. ID No. 4645	1223944	1223878	1223180	Seq. ID No. 4646
2220b	Seq. ID No. 4647	1223944	1223899	1223180	Seq. ID No. 4648
2220c	Seq. ID No. 4649	1223944	1223938	1223180	Seq. ID No. 4650
2221	Seq. ID No. 4651	1224470	1224470	1223904	Seq. ID No. 4652
2222	Seq. ID No. 4653	1225280	1225268	1224471	Seq. ID No. 4654
2223a	Seq. ID No. 4655	1225739	1225661	1225281	Seq. ID No. 4656
2223b	Seq. ID No. 4657	1225739	1225700	1225281	Seq. ID No. 4658
2225	Seq. ID No. 4659	1225293	1225299	1225634	Seq. ID No. 4660
2226	Seq. ID No. 4661	1226654	1226639	1225824	Seq. ID No. 4662
2227	Seq. ID No. 4663	1227837	1227819	1226650	Seq. ID No. 4664
2228a	Seq. ID No. 4665	1228938	1228710	1228009	Seq. ID No. 4666
2228b	Seq. ID No. 4667	1228938	1228809	1228009	Seq. ID No. 4668
2228c	Seq. ID No. 4669	1228938	1228920	1228009	Seq. ID No. 4670
2231	Seq. ID No. 4671	1229408	1229393	1228929	Seq. ID No. 4672
2232	Seq. ID No. 4673	1230413	1230371	1229511	Seq. ID No. 4674
2234a	Seq. ID No. 4675	1232266	1232191	1230434	Seq. ID No. 4676
2234b	Seq. ID No. 4677	1232266	1232194	1230434	Seq. ID No. 4678
2234c	Seq. ID No. 4679	1232266	1232203	1230434	Seq. ID No. 4680
2236a	Seq. ID No. 4681	1231236	1231488	1231871	Seq. ID No. 4682
2236b	Seq. ID No. 4683	1231236	1231266	1231871	Seq. ID No. 4684
2238	Seq. ID No. 4685	1233192	1233186	1232224	Seq. ID No. 4686
2239b	Seq. ID No. 4687	1232255	1232264	1232569	Seq. ID No. 4688
2240a	Seq. ID No. 4689	1236616	1236499	1233293	Seq. ID No. 4690
2240b	Seq. ID No. 4691	1236616	1236571	1233293	Seq. ID No. 4692
2240c	Seq. ID No. 4693	1236616	1236607	1233293	Seq. ID No. 4694
2243a	Seq. ID No. 4695	1234812	1234866	1235147	Seq. ID No. 4696

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2244	Seq. ID No. 4697	1237063	1237051	1236710	Seq. ID No. 4698
2245	Seq. ID No. 4699	1236540	1236573	1236899	Seq. ID No. 4700
2246	Seq. ID No. 4701	1237191	1237188	1236955	Seq. ID No. 4702
2248	Seq. ID No. 4703	1237171	1237180	1237992	Seq. ID No. 4704
2249	Seq. ID No. 4705	1240000	1239967	1238063	Seq. ID No. 4706
2253a	Seq. ID No. 4707	1240985	1240250	1239996	Seq. ID No. 4708
2253b	Seq. ID No. 4709	1240985	1240487	1239996	Seq. ID No. 4710
2253c	Seq. ID No. 4711	1240985	1240508	1239996	Seq. ID No. 4712
2253d	Seq. ID No. 4713	1240985	1240955	1239996	Seq. ID No. 4714
2255a	Seq. ID No. 4715	1241983	1241392	1240976	Seq. ID No. 4716
2255b	Seq. ID No. 4717	1241983	1241938	1240976	Seq. ID No. 4718
2256	Seq. ID No. 4719	1242954	1242936	1241938	Seq. ID No. 4720
2257	Seq. ID No. 4721	1241664	1241670	1241996	Seq. ID No. 4722
2259a	Seq. ID No. 4723	1243340	1243250	1242933	Seq. ID No. 4724
2259b	Seq. ID No. 4725	1243340	1243280	1242933	Seq. ID No. 4726
2260b	Seq. ID No. 4727	1243953	1243842	1243264	Seq. ID No. 4728
2260c	Seq. ID No. 4729	1243953	1243941	1243264	Seq. ID No. 4730
2262	Seq. ID No. 4731	1244377	1244347	1244105	Seq. ID No. 4732
2263	Seq. ID No. 4733	1245473	1245458	1244454	Seq. ID No. 4734
2264a	Seq. ID No. 4735	1244629	1244707	1244976	Seq. ID No. 4736
2264b	Seq. ID No. 4737	1244629	1244662	1244976	Seq. ID No. 4738
2267	Seq. ID No. 4739	1247508	1247496	1245469	Seq. ID No. 4740
2268	Seq. ID No. 4741	1246241	1246247	1246615	Seq. ID No. 4742
2269	Seq. ID No. 4743	1249248	1249239	1247569	Seq. ID No. 4744
2270	Seq. ID No. 4745	1249629	1249626	1249264	Seq. ID No. 4746
2272	Seq. ID No. 4747	1250752	1250749	1250108	Seq. ID No. 4748
2273	Seq. ID No. 4749	1251423	1251405	1250758	Seq. ID No. 4750
2274	Seq. ID No. 4751	1252317	1252305	1251424	Seq. ID No. 4752
2275a	Seq. ID No. 4753	1254354	1254258	1252318	Seq. ID No. 4754

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2275b	Seq. ID No. 4755	1254354	1254339	1252318	Seq. ID No. 4756
2275c	Seq. ID No. 4757	1254354	1254354	1252318	Seq. ID No. 4758
2276a	Seq. ID No. 4759	1255081	1254802	1254299	Seq. ID No. 4760
2276b	Seq. ID No. 4761	1255081	1254958	1254299	Seq. ID No. 4762
2276c	Seq. ID No. 4763	1255081	1255066	1254299	Seq. ID No. 4764
2276d	Seq. ID No. 4765	1255081	1255075	1254299	Seq. ID No. 4766
2277a	Seq. ID No. 4767	1256478	1256451	1255072	Seq. ID No. 4768
2277b	Seq. ID No. 4769	1256478	1256463	1255072	Seq. ID No. 4770
2278a	Seq. ID No. 4771	1257418	1256983	1256438	Seq. ID No. 4772
2278b	Seq. ID No. 4773	1257418	1257376	1256438	Seq. ID No. 4774
2278c	Seq. ID No. 4775	1257418	1257394	1256438	Seq. ID No. 4776
2278d	Seq. ID No. 4777	1257418	1257403	1256438	Seq. ID No. 4778
2280	Seq. ID No. 4779	1259834	1259834	1257408	Seq. ID No. 4780
2284	Seq. ID No. 4781	1261069	1261063	1259858	Seq. ID No. 4782
2285	Seq. ID No. 4783	1261477	1261465	1261241	Seq. ID No. 4784
2286a	Seq. ID No. 4785	1262148	1261971	1261465	Seq. ID No. 4786
2286b	Seq. ID No. 4787	1262148	1262130	1261465	Seq. ID No. 4788
2288	Seq. ID No. 4789	1263490	1263487	1262135	Seq. ID No. 4790
2290	Seq. ID No. 4791	1264398	1264398	1263730	Seq. ID No. 4792
2291a	Seq. ID No. 4793	1265817	1265784	1264405	Seq. ID No. 4794
2291b	Seq. ID No. 4795	1265817	1265799	1264405	Seq. ID No. 4796
2291c	Seq. ID No. 4797	1265817	1265811	1264405	Seq. ID No. 4798
2292a	Seq. ID No. 4799	1267633	1267510	1265777	Seq. ID No. 4800
2292b	Seq. ID No. 4801	1267633	1267570	1265777	Seq. ID No. 4802
2292c	Seq. ID No. 4803	1267633	1267573	1265777	Seq. ID No. 4804
2294	Seq. ID No. 4805	1266308	1266353	1266808	Seq. ID No. 4806
2297	Seq. ID No. 4807	1267892	1267889	1267578	Seq. ID No. 4808
2298	Seq. ID No. 4809	1268895	1268883	1267879	Seq. ID No. 4810
2299	Seq. ID No. 4811	1269489	1269483	1268896	Seq. ID No. 4812

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2300	Seq. ID No. 4813	1270011	1269993	1269514	Seq. ID No. 4814
2301	Seq. ID No. 4815	1271985	1271964	1270018	Seq. ID No. 4816
2302	Seq. ID No. 4817	1269785	1269794	1270087	Seq. ID No. 4818
2303	Seq. ID No. 4819	1270295	1270301	1270528	Seq. ID No. 4820
2304	Seq. ID No. 4821	1272307	1272277	1271951	Seq. ID No. 4822
2306c	Seq. ID No. 4823	1272365	1272404	1272844	Seq. ID No. 4824
2307	Seq. ID No. 4825	1273700	1273679	1272978	Seq. ID No. 4826
2308	Seq. ID No. 4827	1274658	1274640	1273681	Seq. ID No. 4828
2309a	Seq. ID No. 4829	1275133	1274938	1274654	Seq. ID No. 4830
2309b	Seq. ID No. 4831	1275133	1274956	1274654	Seq. ID No. 4832
2309c	Seq. ID No. 4833	1275133	1275010	1274654	Seq. ID No. 4834
2310	Seq. ID No. 4835	1275318	1275294	1275058	Seq. ID No. 4836
2311	Seq. ID No. 4837	1276504	1276489	1275308	Seq. ID No. 4838
2312a	Seq. ID No. 4839	1278512	1278431	1276806	Seq. ID No. 4840
2312b	Seq. ID No. 4841	1278512	1278485	1276806	Seq. ID No. 4842
2312c	Seq. ID No. 4843	1278512	1278494	1276806	Seq. ID No. 4844
2314	Seq. ID No. 4845	1278600	1278633	1279616	Seq. ID No. 4846
2315	Seq. ID No. 4847	1279974	1279980	1280267	Seq. ID No. 4848
2316	Seq. ID No. 4849	1282453	1282450	1280330	Seq. ID No. 4850
2317	Seq. ID No. 4851	1280784	1280841	1281170	Seq. ID No. 4852
2320	Seq. ID No. 4853	1282272	1282278	1282565	Seq. ID No. 4854
2321a	Seq. ID No. 4855	1282966	1282873	1282604	Seq. ID No. 4856
2321b	Seq. ID No. 4857	1282966	1282909	1282604	Seq. ID No. 4858
2321c	Seq. ID No. 4859	1282966	1282939	1282604	Seq. ID No. 4860
2322	Seq. ID No. 4861	1285049	1285034	1283040	Seq. ID No. 4862
2324	Seq. ID No. 4863	1283044	1283068	1283607	Seq. ID No. 4864
2327	Seq. ID No. 4865	1285600	1285549	1285298	Seq. ID No. 4866
2328	Seq. ID No. 4867	1286689	1286668	1285637	Seq. ID No. 4868
2329a	Seq. ID No. 4869	1289009	1287596	1286658	Seq. ID No. 4870



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2329b	Seq. ID No. 4871	1289009	1287857	1286658	Seq. ID No. 4872
2329c	Seq. ID No. 4873	1289009	1288268	1286658	Seq. ID No. 4874
2329d	Seq. ID No. 4875	1289009	1288994	1286658	Seq. ID No. 4876
2330	Seq. ID No. 4877	1289504	1289489	1289010	Seq. ID No. 4878
2331	Seq. ID No. 4879	1290204	1290183	1289548	Seq. ID No. 4880
2333	Seq. ID No. 4881	1290847	1290847	1290371	Seq. ID No. 4882
2335	Seq. ID No. 4883	1291411	1291402	1290848	Seq. ID No. 4884
2336	Seq. ID No. 4885	1291822	1291732	1291412	Seq. ID No. 4886
2337b	Seq. ID No. 4887	1292097	1292079	1291810	Seq. ID No. 4888
2338a	Seq. ID No. 4889	1293987	1293840	1292143	Seq. ID No. 4890
2338b	Seq. ID No. 4891	1293987	1293891	1292143	Seq. ID No. 4892
2338c	Seq. ID No. 4893	1293987	1293972	1292143	Seq. ID No. 4894
2342a	Seq. ID No. 4895	1294892	1294544	1294074	Seq. ID No. 4896
2342b	Seq. ID No. 4897	1294892	1294781	1294074	Seq. ID No. 4898
2342c	Seq. ID No. 4899	1294892	1294856	1294074	Seq. ID No. 4900
2344	Seq. ID No. 4901	1296464	1296425	1295013	Seq. ID No. 4902
2345	Seq. ID No. 4903	1297883	1297877	1296513	Seq. ID No. 4904
2347	Seq. ID No. 4905	1298903	1298897	1297914	Seq. ID No. 4906
2348	Seq. ID No. 4907	1300105	1300084	1298900	Seq. ID No. 4908
2349a	Seq. ID No. 4909	1300346	1300391	1300954	Seq. ID No. 4910
2349b	Seq. ID No. 4911	1300346	1300373	1300954	Seq. ID No. 4912
2350a	Seq. ID No. 4913	1302119	1302026	1301769	Seq. ID No. 4914
2353	Seq. ID No. 4915	1301242	1301248	1302921	Seq. ID No. 4916
2354	Seq. ID No. 4917	1303618	1303603	1302971	Seq. ID No. 4918
2357	Seq. ID No. 4919	1304669	1304657	1303596	Seq. ID No. 4920
2358	Seq. ID No. 4921	1305415	1305397	1304654	Seq. ID No. 4922
2360	Seq. ID No. 4923	1306366	1306351	1306055	Seq. ID No. 4924
2361a	Seq. ID No. 4925	1306811	1306532	1306110	Seq. ID No. 4926
2361b	Seq. ID No. 4927	1306811	1306745	1306110	Seq. ID No. 4928

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2363a	Seq. ID No. 4929	1307978	1307936	1306833	Seq. ID No. 4930
2363b	Seq. ID No. 4931	1307978	1307975	1306833	Seq. ID No. 4932
2365a	Seq. ID No. 4933	1308165	1308219	1309355	Seq. ID No. 4934
2365b	Seq. ID No. 4935	1308165	1308189	1309355	Seq. ID No. 4936
2366a	Seq. ID No. 4937	1310189	1310135	1309491	Seq. ID No. 4938
2366b	Seq. ID No. 4939	1310189	1310138	1309491	Seq. ID No. 4940
2367	Seq. ID No. 4941	1310796	1310793	1310128	Seq. ID No. 4942
2368	Seq. ID No. 4943	1311881	1311860	1310793	Seq. ID No. 4944
2369	Seq. ID No. 4945	1313031	1313028	1311862	Seq. ID No. 4946
2370	Seq. ID No. 4947	1313797	1313788	1313054	Seq. ID No. 4948
2371a	Seq. ID No. 4949	1312950	1313103	1313339	Seq. ID No. 4950
2372	Seq. ID No. 4951	1313340	1313382	1313705	Seq. ID No. 4952
2373	Seq. ID No. 4953	1314523	1314511	1313798	Seq. ID No. 4954
2374a	Seq. ID No. 4955	1315386	1315314	1314508	Seq. ID No. 4956
2374b	Seq. ID No. 4957	1315386	1315377	1314508	Seq. ID No. 4958
2376	Seq. ID No. 4959	1316374	1316374	1315394	Seq. ID No. 4960
2377a	Seq. ID No. 4961	1317653	1317590	1316367	Seq. ID No. 4962
2377b	Seq. ID No. 4963	1317653	1317650	1316367	Seq. ID No. 4964
2378	Seq. ID No. 4965	1318340	1318334	1318038	Seq. ID No. 4966
2379a	Seq. ID No. 4967	1318807	1318741	1318331	Seq. ID No. 4968
2379b	Seq. ID No. 4969	1318807	1318750	1318331	Seq. ID No. 4970
2380	Seq. ID No. 4971	1319037	1319019	1318747	Seq. ID No. 4972
2381	Seq. ID No. 4973	1320232	1320205	1319264	Seq. ID No. 4974
2382c	Seq. ID No. 4975	1319889	1319790	1319509	Seq. ID No. 4976
2384a	Seq. ID No. 4977	1322997	1322961	1320310	Seq. ID No. 4978
2384b	Seq. ID No. 4979	1322997	1322982	1320310	Seq. ID No. 4980
2386b	Seq. ID No. 4981	1322660	1322696	1323103	Seq. ID No. 4982
2386c	Seq. ID No. 4983	1322660	1322675	1323103	Seq. ID No. 4984
2387	Seq. ID No. 4985	1324321	1324225	1323305	Seq. ID No. 4986

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2390	Seq. ID No. 4987	1324802	1324754	1324458	Seq. ID No. 4988
2391	Seq. ID No. 4989	1324273	1324294	1325208	Seq. ID No. 4990
2392	Seq. ID No. 4991	1327683	1327665	1325251	Seq. ID No. 4992
2394	Seq. ID No. 4993	1325873	1325882	1326148	Seq. ID No. 4994
2395	Seq. ID No. 4995	1328666	1328639	1327779	Seq. ID No. 4996
2396	Seq. ID No. 4997	1329927	1329906	1328779	Seq. ID No. 4998
2397	Seq. ID No. 4999	1328731	1328752	1329045	Seq. ID No. 5000
2398	Seq. ID No. 5001	1330390	1330381	1330037	Seq. ID No. 5002
2399a	Seq. ID No. 5003	1331563	1331224	1330391	Seq. ID No. 5004
2399b	Seq. ID No. 5005	1331563	1331488	1330391	Seq. ID No. 5006
2399c	Seq. ID No. 5007	1331563	1331542	1330391	Seq. ID No. 5008
2401	Seq. ID No. 5009	1333918	1333894	1331564	Seq. ID No. 5010
2402a	Seq. ID No. 5011	1334374	1334266	1334003	Seq. ID No. 5012
2402b	Seq. ID No. 5013	1334374	1334305	1334003	Seq. ID No. 5014
2403a	Seq. ID No. 5015	1333974	1334010	1335254	Seq. ID No. 5016
2403b	Seq. ID No. 5017	1333974	1333986	1335254	Seq. ID No. 5018
2404a	Seq. ID No. 5019	1337114	1336970	1335393	Seq. ID No. 5020
2404b	Seq. ID No. 5021	1337114	1337108	1335393	Seq. ID No. 5022
2407a	Seq. ID No. 5023	1336219	1336225	1336524	Seq. ID No. 5024
2409a	Seq. ID No. 5025	1337582	1337615	1338046	Seq. ID No. 5026
2409b	Seq. ID No. 5027	1337582	1337606	1338046	Seq. ID No. 5028
2410	Seq. ID No. 5029	1339429	1339369	1338176	Seq. ID No. 5030
2412	Seq. ID No. 5031	1339044	1339017	1338787	Seq. ID No. 5032
2413a	Seq. ID No. 5033	1338351	1338411	1338818	Seq. ID No. 5034
2413b	Seq. ID No. 5035	1338351	1338357	1338818	Seq. ID No. 5036
2415a	Seq. ID No. 5037	1339712	1339586	1339392	Seq. ID No. 5038
2415b	Seq. ID No. 5039	1339712	1339688	1339392	Seq. ID No. 5040
2416b	Seq. ID No. 5041	1338897	1338969	1339433	Seq. ID No. 5042
2416c	Seq. ID No. 5043	1338897	1338915	1339433	Seq. ID No. 5044

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2417a	Seq. ID No. 5045	1340413	1340371	1339583	Seq. ID No. 5046
2417b	Seq. ID No. 5047	1340413	1340398	1339583	Seq. ID No. 5048
2418a	Seq. ID No. 5049	1340847	1340808	1340524	Seq. ID No. 5050
2418b	Seq. ID No. 5051	1340847	1340817	1340524	Seq. ID No. 5052
2420	Seq. ID No. 5053	1341166	1341157	1340795	Seq. ID No. 5054
2421	Seq. ID No. 5055	1341520	1341478	1341170	Seq. ID No. 5056
2422b	Seq. ID No. 5057	1342395	1342347	1341700	Seq. ID No. 5058
2422c	Seq. ID No. 5059	1342395	1342395	1341700	Seq. ID No. 5060
2423a	Seq. ID No. 5061	1343009	1342928	1342413	Seq. ID No. 5062
2423b	Seq. ID No. 5063	1343009	1342994	1342413	Seq. ID No. 5064
2424a	Seq. ID No. 5065	1343829	1343793	1342930	Seq. ID No. 5066
2424b	Seq. ID No. 5067	1343829	1343799	1342930	Seq. ID No. 5068
2424c	Seq. ID No. 5069	1343829	1343817	1342930	Seq. ID No. 5070
2426	Seq. ID No. 5071	1344336	1344336	1344130	Seq. ID No. 5072
2428a	Seq. ID No. 5073	1344573	1344774	1345985	Seq. ID No. 5074
2428b	Seq. ID No. 5075	1344573	1344648	1345985	Seq. ID No. 5076
2428c	Seq. ID No. 5077	1344573	1344579	1345985	Seq. ID No. 5078
2429	Seq. ID No. 5079	1346793	1346718	1346035	Seq. ID No. 5080
2432	Seq. ID No. 5081	1347442	1347430	1346780	Seq. ID No. 5082
2433	Seq. ID No. 5083	1350107	1350095	1347432	Seq. ID No. 5084
2434	Seq. ID No. 5085	1347436	1347457	1347729	Seq. ID No. 5086
2440	Seq. ID No. 5087	1351640	1351607	1350387	Seq. ID No. 5088
2442a	Seq. ID No. 5089	1352776	1352596	1351619	Seq. ID No. 5090
2442b	Seq. ID No. 5091	1352776	1352761	1351619	Seq. ID No. 5092
2443	Seq. ID No. 5093	1353214	1353199	1352876	Seq. ID No. 5094
2444a	Seq. ID No. 5095	1354016	1353962	1353192	Seq. ID No. 5096
2444b	Seq. ID No. 5097	1354016	1353977	1353192	Seq. ID No. 5098
2444c	Seq. ID No. 5099	1354016	1354001	1353192	Seq. ID No. 5100
2444d	Seq. ID No. 5101	1354016	1354007	1353192	Seq. ID No. 5102

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2445	Seq. ID No. 5103	1354599	1354581	1353931	Seq. ID No. 5104
2448b	Seq. ID No. 5105	1354686	1354710	1355162	Seq. ID No. 5106
2449a	Seq. ID No. 5107	1355925	1355691	1355272	Seq. ID No. 5108
2449b	Seq. ID No. 5109	1355925	1355877	1355272	Seq. ID No. 5110
2451	Seq. ID No. 5111	1356746	1356734	1356105	Seq. ID No. 5112
2452	Seq. ID No. 5113	1356996	1357029	1358138	Seq. ID No. 5114
2453	Seq. ID No. 5115	1359295	1359286	1358234	Seq. ID No. 5116
2455	Seq. ID No. 5117	1360072	1360054	1359296	Seq. ID No. 5118
2456a	Seq. ID No. 5119	1361028	1360605	1360051	Seq. ID No. 5120
2456b	Seq. ID No. 5121	1361028	1360677	1360051	Seq. ID No. 5122
2456c	Seq. ID No. 5123	1361028	1360941	1360051	Seq. ID No. 5124
2456d	Seq. ID No. 5125	1361028	1361013	1360051	Seq. ID No. 5126
2456e	Seq. ID No. 5127	1361028	1361025	1360051	Seq. ID No. 5128
2458a	Seq. ID No. 5129	1362001	1361608	1361003	Seq. ID No. 5130
2458b	Seq. ID No. 5131	1362001	1361680	1361003	Seq. ID No. 5132
2458c	Seq. ID No. 5133	1362001	1361764	1361003	Seq. ID No. 5134
2458d	Seq. ID No. 5135	1362001	1361767	1361003	Seq. ID No. 5136
2458e	Seq. ID No. 5137	1362001	1361854	1361003	Seq. ID No. 5138
2458f	Seq. ID No. 5139	1362001	1361983	1361003	Seq. ID No. 5140
2458g	Seq. ID No. 5141	1362001	1361986	1361003	Seq. ID No. 5142
2461a	Seq. ID No. 5143	1363565	1363550	1362201	Seq. ID No. 5144
2461b	Seq. ID No. 5145	1363565	1363556	1362201	Seq. ID No. 5146
2462a	Seq. ID No. 5147	1364408	1364270	1363584	Seq. ID No. 5148
2462b	Seq. ID No. 5149	1364408	1364294	1363584	Seq. ID No. 5150
2463a	Seq. ID No. 5151	1363279	1363366	1363731	Seq. ID No. 5152
2464	Seq. ID No. 5153	1364536	1364536	1364309	Seq. ID No. 5154
2465a	Seq. ID No. 5155	1365094	1365082	1364537	Seq. ID No. 5156
2465b	Seq. ID No. 5157	1365094	1365094	1364537	Seq. ID No. 5158
2468a	Seq. ID No. 5159	1365781	1365751	1365422	Seq. ID No. 5160

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2468b	Seq. ID No. 5161	1365781	1365775	1365422	Seq. ID No. 5162
2469a	Seq. ID No. 5163	1365183	1365474	1365908	Seq. ID No. 5164
2469b	Seq. ID No. 5165	1365183	1365204	1365908	Seq. ID No. 5166
2470	Seq. ID No. 5167	1367011	1367011	1366664	Seq. ID No. 5168
2471	Seq. ID No. 5169	1365926	1365932	1366858	Seq. ID No. 5170
2473	Seq. ID No. 5171	1366716	1366872	1367141	Seq. ID No. 5172
2474a	Seq. ID No. 5173	1367135	1367240	1367476	Seq. ID No. 5174
2474b	Seq. ID No. 5175	1367135	1367189	1367476	Seq. ID No. 5176
2474c	Seq. ID No. 5177	1367135	1367135	1367476	Seq. ID No. 5178
2475a	Seq. ID No. 5179	1370572	1370467	1367687	Seq. ID No. 5180
2475b	Seq. ID No. 5181	1370572	1370503	1367687	Seq. ID No. 5182
2475c	Seq. ID No. 5183	1370572	1370509	1367687	Seq. ID No. 5184
2477	Seq. ID No. 5185	1371542	1371515	1370790	Seq. ID No. 5186
2480	Seq. ID No. 5187	1372374	1372365	1371577	Seq. ID No. 5188
2481a	Seq. ID No. 5189	1371566	1371596	1372078	Seq. ID No. 5190
2481b	Seq. ID No. 5191	1371566	1371569	1372078	Seq. ID No. 5192
2482	Seq. ID No. 5193	1372662	1372662	1372375	Seq. ID No. 5194
2483	Seq. ID No. 5195	1373156	1373144	1372683	Seq. ID No. 5196
2484a	Seq. ID No. 5197	1373586	1373568	1373149	Seq. ID No. 5198
2484b	Seq. ID No. 5199	1373586	1373580	1373149	Seq. ID No. 5200
2485	Seq. ID No. 5201	1374427	1374400	1373168	Seq. ID No. 5202
2489	Seq. ID No. 5203	1375804	1375792	1374428	Seq. ID No. 5204
2490	Seq. ID No. 5205	1376880	1376880	1375942	Seq. ID No. 5206
2492a	Seq. ID No. 5207	1378075	1377256	1376897	Seq. ID No. 5208
2492b	Seq. ID No. 5209	1378075	1378060	1376897	Seq. ID No. 5210
2494	Seq. ID No. 5211	1379477	1379453	1378050	Seq. ID No. 5212
2495a	Seq. ID No. 5213	1380488	1380320	1379526	Seq. ID No. 5214
2495b	Seq. ID No. 5215	1380488	1380479	1379526	Seq. ID No. 5216
2497a	Seq. ID No. 5217	1382929	1382839	1380632	Seq. ID No. 5218

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2497b	Seq. ID No. 5219	1382929	1382926	1380632	Seq. ID No. 5220
2498b	Seq. ID No. 5221	1380214	1380247	1380741	Seq. ID No. 5222
2500a	Seq. ID No. 5223	1383330	1383216	1382926	Seq. ID No. 5224
2500b	Seq. ID No. 5225	1383330	1383318	1382926	Seq. ID No. 5226
2500c	Seq. ID No. 5227	1383330	1383327	1382926	Seq. ID No. 5228
2501a	Seq. ID No. 5229	1384292	1384196	1383324	Seq. ID No. 5230
2501b	Seq. ID No. 5231	1384292	1384280	1383324	Seq. ID No. 5232
2504a	Seq. ID No. 5233	1384748	1384718	1384293	Seq. ID No. 5234
2504b	Seq. ID No. 5235	1384748	1384724	1384293	Seq. ID No. 5236
2505	Seq. ID No. 5237	1385365	1385353	1384976	Seq. ID No. 5238
2506	Seq. ID No. 5239	1386567	1386534	1385977	Seq. ID No. 5240
2507b	Seq. ID No. 5241	1387792	1387783	1386590	Seq. ID No. 5242
2507c	Seq. ID No. 5243	1387792	1387792	1386590	Seq. ID No. 5244
2510	Seq. ID No. 5245	1388536	1388533	1387814	Seq. ID No. 5246
2512c	Seq. ID No. 5247	1388904	1388901	1388533	Seq. ID No. 5248
2513a	Seq. ID No. 5249	1389534	1389486	1388905	Seq. ID No. 5250
2513b	Seq. ID No. 5251	1389534	1389516	1388905	Seq. ID No. 5252
2513c	Seq. ID No. 5253	1389534	1389525	1388905	Seq. ID No. 5254
2514	Seq. ID No. 5255	1390141	1390135	1389491	Seq. ID No. 5256
2515	Seq. ID No. 5257	1390451	1390451	1390137	Seq. ID No. 5258
2516a	Seq. ID No. 5259	1391642	1391396	1390482	Seq. ID No. 5260
2516b	Seq. ID No. 5261	1391642	1391627	1390482	Seq. ID No. 5262
2517a	Seq. ID No. 5263	1392251	1392185	1391643	Seq. ID No. 5264
2517b	Seq. ID No. 5265	1392251	1392248	1391643	Seq. ID No. 5266
2518a	Seq. ID No. 5267	1391575	1391770	1392045	Seq. ID No. 5268
2519a	Seq. ID No. 5269	1392498	1392462	1392199	Seq. ID No. 5270
2519b	Seq. ID No. 5271	1392498	1392492	1392199	Seq. ID No. 5272
2520a	Seq. ID No. 5273	1394487	1394379	1392658	Seq. ID No. 5274
2520b	Seq. ID No. 5275	1394487	1394400	1392658	Seq. ID No. 5276

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2520c	Seq. ID No. 5277	1394487	1394469	1392658	Seq. ID No. 5278
2520d	Seq. ID No. 5279	1394487	1394487	1392658	Seq. ID No. 5280
2521	Seq. ID No. 5281	1393493	1393499	1393756	Seq. ID No. 5282
2523	Seq. ID No. 5283	1394650	1394647	1394381	Seq. ID No. 5284
2525a	Seq. ID No. 5285	1396526	1396475	1396092	Seq. ID No. 5286
2525b	Seq. ID No. 5287	1396526	1396490	1396092	Seq. ID No. 5288
2527a	Seq. ID No. 5289	1394878	1395148	1397184	Seq. ID No. 5290
2527b	Seq. ID No. 5291	1394878	1394953	1397184	Seq. ID No. 5292
2528a	Seq. ID No. 5293	1399138	1398754	1397267	Seq. ID No. 5294
2528b	Seq. ID No. 5295	1399138	1398850	1397267	Seq. ID No. 5296
2528c	Seq. ID No. 5297	1399138	1398922	1397267	Seq. ID No. 5298
2528d	Seq. ID No. 5299	1399138	1398961	1397267	Seq. ID No. 5300
2532b	Seq. ID No. 5301	1397745	1397808	1398275	Seq. ID No. 5302
2532c	Seq. ID No. 5303	1397745	1397772	1398275	Seq. ID No. 5304
2534	Seq. ID No. 5305	1399875	1399866	1398979	Seq. ID No. 5306
2535a	Seq. ID No. 5307	1400680	1400668	1399847	Seq. ID No. 5308
2535b	Seq. ID No. 5309	1400680	1400674	1399847	Seq. ID No. 5310
2538	Seq. ID No. 5311	1401349	1401310	1400681	Seq. ID No. 5312
2541	Seq. ID No. 5313	1401366	1401387	1401971	Seq. ID No. 5314
2542a	Seq. ID No. 5315	1402014	1402296	1402676	Seq. ID No. 5316
2542b	Seq. ID No. 5317	1402014	1402077	1402676	Seq. ID No. 5318
2542c	Seq. ID No. 5319	1402014	1402062	1402676	Seq. ID No. 5320
2543	Seq. ID No. 5321	1403760	1403730	1403266	Seq. ID No. 5322
2544	Seq. ID No. 5323	1403203	1403254	1404255	Seq. ID No. 5324
2545	Seq. ID No. 5325	1404256	1404304	1404855	Seq. ID No. 5326
2546	Seq. ID No. 5327	1405305	1405302	1405021	Seq. ID No. 5328
2547b	Seq. ID No. 5329	1406040	1406031	1405459	Seq. ID No. 5330
2547c	Seq. ID No. 5331	1406040	1406037	1405459	Seq. ID No. 5332
2548a	Seq. ID No. 5333	1404971	1405037	1405978	Seq. ID No. 5334



TABLE 2: ALL CLAIMED ORFS

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2548b	Seq. ID No. 5335	1404971	1404995	1405978	Seq. ID No. 5336
2549	Seq. ID No. 5337	1405979	1405988	1406572	Seq. ID No. 5338
2550b	Seq. ID No. 5339	1406454	1406559	1406936	Seq. ID No. 5340
2550c	Seq. ID No. 5341	1406454	1406538	1406936	Seq. ID No. 5342
2550e	Seq. ID No. 5343	1406454	1406469	1406936	Seq. ID No. 5344
2552	Seq. ID No. 5345	1407012	1407042	1408169	Seq. ID No. 5346
2553	Seq. ID No. 5347	1408922	1408922	1408764	Seq. ID No. 5348
2554a	Seq. ID No. 5349	1410070	1410022	1409012	Seq. ID No. 5350
2554b	Seq. ID No. 5351	1410070	1410031	1409012	Seq. ID No. 5352
2555a	Seq. ID No. 5353	1410981	1410666	1410037	Seq. ID No. 5354
2555b	Seq. ID No. 5355	1410981	1410930	1410037	Seq. ID No. 5356
2555c	Seq. ID No. 5357	1410981	1410954	1410037	Seq. ID No. 5358
2555d	Seq. ID No. 5359	1410981	1410960	1410037	Seq. ID No. 5360
2558a	Seq. ID No. 5361	1411225	1411165	1410899	Seq. ID No. 5362
2558b	Seq. ID No. 5363	1411225	1411183	1410899	Seq. ID No. 5364
2559	Seq. ID No. 5365	1411808	1411841	1413085	Seq. ID No. 5366
2561	Seq. ID No. 5367	1413552	1413567	1414415	Seq. ID No. 5368
2562a	Seq. ID No. 5369	1414348	1414450	1414695	Seq. ID No. 5370
2562c	Seq. ID No. 5371	1414348	1414396	1414695	Seq. ID No. 5372
2563	Seq. ID No. 5373	1416663	1416645	1414831	Seq. ID No. 5374
2564a	Seq. ID No. 5375	1417575	1417422	1416748	Seq. ID No. 5376
2564b	Seq. ID No. 5377	1417575	1417524	1416748	Seq. ID No. 5378
2564c	Seq. ID No. 5379	1417575	1417533	1416748	Seq. ID No. 5380
2564d	Seq. ID No. 5381	1417575	1417569	1416748	Seq. ID No. 5382
2566	Seq. ID No. 5383	1418729	1418708	1417590	Seq. ID No. 5384
2567a	Seq. ID No. 5385	1419622	1419307	1418843	Seq. ID No. 5386
2567b	Seq. ID No. 5387	1419622	1419610	1418843	Seq. ID No. 5388
2568	Seq. ID No. 5389	1420782	1420740	1419607	Seq. ID No. 5390
2572	Seq. ID No. 5391	1421908	1421875	1420760	Seq. ID No. 5392

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2573	Seq. ID No. 5393	1422663	1422660	1421995	Seq. ID No. 5394
2575	Seq. ID No. 5395	1423311	1423263	1422889	Seq. ID No. 5396
2576	Seq. ID No. 5397	1424366	1424318	1423299	Seq. ID No. 5398
2578	Seq. ID No. 5399	1424941	1424926	1424564	Seq. ID No. 5400
2579b	Seq. ID No. 5401	1425765	1425729	1425178	Seq. ID No. 5402
2581	Seq. ID No. 5403	1426786	1426756	1425986	Seq. ID No. 5404
2582a	Seq. ID No. 5405	1427718	1427607	1426879	Seq. ID No. 5406
2582b	Seq. ID No. 5407	1427718	1427694	1426879	Seq. ID No. 5408
2582c	Seq. ID No. 5409	1427718	1427712	1426879	Seq. ID No. 5410
2585	Seq. ID No. 5411	1429438	1429423	1427699	Seq. ID No. 5412
2587a	Seq. ID No. 5413	1429982	1429652	1429425	Seq. ID No. 5414
2587b	Seq. ID No. 5415	1429982	1429982	1429425	Seq. ID No. 5416
2588	Seq. ID No. 5417	1430858	1430852	1429983	Seq. ID No. 5418
2589	Seq. ID No. 5419	1433411	1433399	1431450	Seq. ID No. 5420
2591	Seq. ID No. 5421	1434679	1434667	1433714	Seq. ID No. 5422
2592	Seq. ID No. 5423	1435611	1435470	1434667	Seq. ID No. 5424
2593a	Seq. ID No. 5425	1436075	1435949	1435482	Seq. ID No. 5426
2593b	Seq. ID No. 5427	1436075	1436042	1435482	Seq. ID No. 5428
2594a	Seq. ID No. 5429	1436529	1436517	1436059	Seq. ID No. 5430
2594b	Seq. ID No. 5431	1436529	1436526	1436059	Seq. ID No. 5432
2596	Seq. ID No. 5433	1437374	1437374	1436709	Seq. ID No. 5434
2597a	Seq. ID No. 5435	1438188	1437930	1437334	Seq. ID No. 5436
2597b	Seq. ID No. 5437	1438188	1438107	1437334	Seq. ID No. 5438
2597c	Seq. ID No. 5439	1438188	1438158	1437334	Seq. ID No. 5440
2598	Seq. ID No. 5441	1440874	1440859	1438196	Seq. ID No. 5442
2602	Seq. ID No. 5443	1442399	1442396	1441065	Seq. ID No. 5444
2605a	Seq. ID No. 5445	1442989	1442629	1442468	Seq. ID No. 5446
2605b	Seq. ID No. 5447	1442989	1442968	1442468	Seq. ID No. 5448
2606	Seq. ID No. 5449	1443636	1443591	1442983	Seq. ID No. 5450

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2608	Seq. ID No. 5451	1444685	1444676	1443603	Seq. ID No. 5452
2610	Seq. ID No. 5453	1444840	1444840	1445172	Seq. ID No. 5454
2611	Seq. ID No. 5455	1445942	1445927	1445280	Seq. ID No. 5456
2613	Seq. ID No. 5457	1446810	1446789	1445992	Seq. ID No. 5458
2616a	Seq. ID No. 5459	1448123	1447217	1446882	Seq. ID No. 5460
2616b	Seq. ID No. 5461	1448123	1447583	1446882	Seq. ID No. 5462
2616c	Seq. ID No. 5463	1448123	1447613	1446882	Seq. ID No. 5464
2616d	Seq. ID No. 5465	1448123	1447805	1446882	Seq. ID No. 5466
2616e	Seq. ID No. 5467	1448123	1447850	1446882	Seq. ID No. 5468
2616f	Seq. ID No. 5469	1448123	1447976	1446882	Seq. ID No. 5470
2616g	Seq. ID No. 5471	1448123	1448084	1446882	Seq. ID No. 5472
2616h	Seq. ID No. 5473	1448123	1448093	1446882	Seq. ID No. 5474
2617a	Seq. ID No. 5475	1448922	1448838	1448077	Seq. ID No. 5476
2617b	Seq. ID No. 5477	1448922	1448922	1448077	Seq. ID No. 5478
2618a	Seq. ID No. 5479	1448201	1448282	1448533	Seq. ID No. 5480
2618b	Seq. ID No. 5481	1448201	1448249	1448533	Seq. ID No. 5482
2619	Seq. ID No. 5483	1448954	1448987	1449424	Seq. ID No. 5484
2620	Seq. ID No. 5485	1449683	1449668	1449456	Seq. ID No. 5486
2621a	Seq. ID No. 5487	1449261	1449426	1449758	Seq. ID No. 5488
2623a	Seq. ID No. 5489	1451028	1450824	1449895	Seq. ID No. 5490
2623b	Seq. ID No. 5491	1451028	1451010	1449895	Seq. ID No. 5492
2624a	Seq. ID No. 5493	1452149	1452101	1451130	Seq. ID No. 5494
2624b	Seq. ID No. 5495	1452149	1452110	1451130	Seq. ID No. 5496
2625a	Seq. ID No. 5497	1454863	1453486	1452116	Seq. ID No. 5498
2625b	Seq. ID No. 5499	1454863	1454809	1452116	Seq. ID No. 5500
2626a	Seq. ID No. 5501	1456055	1455935	1454820	Seq. ID No. 5502
2626b	Seq. ID No. 5503	1456055	1455998	1454820	Seq. ID No. 5504
2627a	Seq. ID No. 5505	1456504	1456453	1456079	Seq. ID No. 5506
2627b	Seq. ID No. 5507	1456504	1456465	1456079	Seq. ID No. 5508

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2628	Seq. ID No. 5509	1457511	1457484	1456576	Seq. ID No. 5510
2629a	Seq. ID No. 5511	1459560	1459494	1457665	Seq. ID No. 5512
2629b	Seq. ID No. 5513	1459560	1459539	1457665	Seq. ID No. 5514
2631	Seq. ID No. 5515	1458482	1458482	1458249	Seq. ID No. 5516
2632	Seq. ID No. 5517	1459307	1459322	1459567	Seq. ID No. 5518
2633a	Seq. ID No. 5519	1461946	1461220	1459916	Seq. ID No. 5520
2633b	Seq. ID No. 5521	1461946	1461544	1459916	Seq. ID No. 5522
2633c	Seq. ID No. 5523	1461946	1461727	1459916	Seq. ID No. 5524
2633d	Seq. ID No. 5525	1461946	1461778	1459916	Seq. ID No. 5526
2633e	Seq. ID No. 5527	1461946	1461904	1459916	Seq. ID No. 5528
2637a	Seq. ID No. 5529	1463997	1463967	1462111	Seq. ID No. 5530
2637b	Seq. ID No. 5531	1463997	1463991	1462111	Seq. ID No. 5532
2642	Seq. ID No. 5533	1463789	1463825	1464121	Seq. ID No. 5534
2643a	Seq. ID No. 5535	1466534	1466318	1464372	Seq. ID No. 5536
2643b	Seq. ID No. 5537	1466534	1466522	1464372	Seq. ID No. 5538
2645	Seq. ID No. 5539	1467800	1467782	1466751	Seq. ID No. 5540
2647	Seq. ID No. 5541	1468855	1468774	1467806	Seq. ID No. 5542
2648a	Seq. ID No. 5543	1468422	1468452	1468748	Seq. ID No. 5544
2648b	Seq. ID No. 5545	1468422	1468449	1468748	Seq. ID No. 5546
2649	Seq. ID No. 5547	1470087	1470087	1468786	Seq. ID No. 5548
2650	Seq. ID No. 5549	1468988	1468994	1469452	Seq. ID No. 5550
2652a	Seq. ID No. 5551	1471356	1471212	1470088	Seq. ID No. 5552
2652b	Seq. ID No. 5553	1471356	1471272	1470088	Seq. ID No. 5554
2655a	Seq. ID No. 5555	1471693	1471618	1471307	Seq. ID No. 5556
2655b	Seq. ID No. 5557	1471693	1471666	1471307	Seq. ID No. 5558
2656	Seq. ID No. 5559	1472777	1472771	1471758	Seq. ID No. 5560
2658a	Seq. ID No. 5561	1473451	1473403	1472798	Seq. ID No. 5562
2658b	Seq. ID No. 5563	1473451	1473430	1472798	Seq. ID No. 5564
2659a	Seq. ID No. 5565	1474937	1474799	1473552	Seq. ID No. 5566

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2659b	Seq. ID No. 5567	1474937	1474931	1473552	Seq. ID No. 5568
2660	Seq. ID No. 5569	1474156	1474156	1474392	Seq. ID No. 5570
2662	Seq. ID No. 5571	1475396	1475390	1474959	Seq. ID No. 5572
2664a	Seq. ID No. 5573	1477384	1477357	1475402	Seq. ID No. 5574
2664b	Seq. ID No. 5575	1477384	1477375	1475402	Seq. ID No. 5576
2665	Seq. ID No. 5577	1476161	1476173	1476403	Seq. ID No. 5578
2666a	Seq. ID No. 5579	1479987	1479798	1477390	Seq. ID No. 5580
2666b	Seq. ID No. 5581	1479987	1479987	1477390	Seq. ID No. 5582
2667a	Seq. ID No. 5583	1480983	1480833	1480003	Seq. ID No. 5584
2667b	Seq. ID No. 5585	1480983	1480860	1480003	Seq. ID No. 5586
2669a	Seq. ID No. 5587	1482332	1482248	1480950	Seq. ID No. 5588
2669b	Seq. ID No. 5589	1482332	1482296	1480950	Seq. ID No. 5590
2669c	Seq. ID No. 5591	1482332	1482305	1480950	Seq. ID No. 5592
2672	Seq. ID No. 5593	1481077	1481095	1481394	Seq. ID No. 5594
2673	Seq. ID No. 5595	1481941	1481944	1482171	Seq. ID No. 5596
2674a	Seq. ID No. 5597	1484170	1483174	1482620	Seq. ID No. 5598
2674b	Seq. ID No. 5599	1484170	1484128	1482620	Seq. ID No. 5600
2676	Seq. ID No. 5601	1485021	1485003	1484260	Seq. ID No. 5602
2677a	Seq. ID No. 5603	1486187	1486013	1485009	Seq. ID No. 5604
2677b	Seq. ID No. 5605	1486187	1486094	1485009	Seq. ID No. 5606
2677c	Seq. ID No. 5607	1486187	1486172	1485009	Seq. ID No. 5608
2679a	Seq. ID No. 5609	1486773	1486521	1486042	Seq. ID No. 5610
2679b	Seq. ID No. 5611	1486773	1486701	1486042	Seq. ID No. 5612
2679c	Seq. ID No. 5613	1486773	1486764	1486042	Seq. ID No. 5614
2679d	Seq. ID No. 5615	1486773	1486773	1486042	Seq. ID No. 5616
2680a	Seq. ID No. 5617	1488572	1488065	1487013	Seq. ID No. 5618
2680b	Seq. ID No. 5619	1488572	1488401	1487013	Seq. ID No. 5620
2680c	Seq. ID No. 5621	1488572	1488572	1487013	Seq. ID No. 5622
2683a	Seq. ID No. 5623	1487806	1487878	1488216	Seq. ID No. 5624

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2683b	Seq. ID No. 5625	1487806	1487839	1488216	Seq. ID No. 5626
2684a	Seq. ID No. 5627	1489943	1489898	1488828	Seq. ID No. 5628
2684b	Seq. ID No. 5629	1489943	1489913	1488828	Seq. ID No. 5630
2686	Seq. ID No. 5631	1491201	1491189	1489990	Seq. ID No. 5632
2688a	Seq. ID No. 5633	1491962	1491728	1491381	Seq. ID No. 5634
2688b	Seq. ID No. 5635	1491962	1491923	1491381	Seq. ID No. 5636
2688c	Seq. ID No. 5637	1491962	1491962	1491381	Seq. ID No. 5638
2689a	Seq. ID No. 5639	1491463	1491526	1491783	Seq. ID No. 5640
2689b	Seq. ID No. 5641	1491463	1491508	1491783	Seq. ID No. 5642
2690a	Seq. ID No. 5643	1492662	1492314	1492012	Seq. ID No. 5644
2690b	Seq. ID No. 5645	1492662	1492623	1492012	Seq. ID No. 5646
2690c	Seq. ID No. 5647	1492662	1492656	1492012	Seq. ID No. 5648
2692b	Seq. ID No. 5649	1492270	1492330	1492617	Seq. ID No. 5650
2693	Seq. ID No. 5651	1494018	1493982	1492696	Seq. ID No. 5652
2694a	Seq. ID No. 5653	1495259	1494968	1493979	Seq. ID No. 5654
2694b	Seq. ID No. 5655	1495259	1495259	1493979	Seq. ID No. 5656
2695	Seq. ID No. 5657	1496442	1496442	1495243	Seq. ID No. 5658
2696a	Seq. ID No. 5659	1496578	1496656	1497375	Seq. ID No. 5660
2696b	Seq. ID No. 5661	1496578	1496623	1497375	Seq. ID No. 5662
2705	Seq. ID No. 5663	1501429	1501429	1501343	Seq. ID No. 5664
2709	Seq. ID No. 5665	1505327	1505300	1504359	Seq. ID No. 5666
2710c	Seq. ID No. 5667	1504984	1504885	1504604	Seq. ID No. 5668
2712	Seq. ID No. 5669	1506916	1506898	1505546	Seq. ID No. 5670
2713	Seq. ID No. 5671	1507318	1507309	1506926	Seq. ID No. 5672
2714	Seq. ID No. 5673	1507705	1507696	1507319	Seq. ID No. 5674
2716a	Seq. ID No. 5675	1508501	1508477	1507878	Seq. ID No. 5676
2716b	Seq. ID No. 5677	1508501	1508486	1507878	Seq. ID No. 5678
2716c	Seq. ID No. 5679	1508501	1508501	1507878	Seq. ID No. 5680
2718a	Seq. ID No. 5681	1508621	1508753	1509109	Seq. ID No. 5682

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2718b	Seq. ID No. 5683	1508621	1508702	1509109	Seq. ID No. 5684
2718c	Seq. ID No. 5685	1508621	1508624	1509109	Seq. ID No. 5686
2719a	Seq. ID No. 5687	1509372	1509399	1509650	Seq. ID No. 5688
2719b	Seq. ID No. 5689	1509372	1509378	1509650	Seq. ID No. 5690
2721a	Seq. ID No. 5691	1509110	1509434	1510138	Seq. ID No. 5692
2721b	Seq. ID No. 5693	1509110	1509143	1510138	Seq. ID No. 5694
2722a	Seq. ID No. 5695	1510153	1510180	1510692	Seq. ID No. 5696
2722b	Seq. ID No. 5697	1510153	1510162	1510692	Seq. ID No. 5698
2723	Seq. ID No. 5699	1511400	1511397	1510747	Seq. ID No. 5700
2724	Seq. ID No. 5701	1512181	1512169	1511390	Seq. ID No. 5702
2725a	Seq. ID No. 5703	1511541	1511553	1511786	Seq. ID No. 5704
2725b	Seq. ID No. 5705	1511541	1511541	1511786	Seq. ID No. 5706
2726	Seq. ID No. 5707	1512847	1512844	1512182	Seq. ID No. 5708
2728a	Seq. ID No. 5709	1512137	1512284	1512532	Seq. ID No. 5710
2728b	Seq. ID No. 5711	1512137	1512275	1512532	Seq. ID No. 5712
2731a	Seq. ID No. 5713	1512977	1513013	1513606	Seq. ID No. 5714
2731b	Seq. ID No. 5715	1512977	1512980	1513606	Seq. ID No. 5716
2732	Seq. ID No. 5717	1514469	1514454	1513648	Seq. ID No. 5718
2734a	Seq. ID No. 5719	1514794	1515100	1515729	Seq. ID No. 5720
2734b	Seq. ID No. 5721	1514794	1514950	1515729	Seq. ID No. 5722
2734c	Seq. ID No. 5723	1514794	1514827	1515729	Seq. ID No. 5724
2735a	Seq. ID No. 5725	1516826	1516781	1515786	Seq. ID No. 5726
2735b	Seq. ID No. 5727	1516826	1516790	1515786	Seq. ID No. 5728
2738a	Seq. ID No. 5729	1518180	1517928	1516897	Seq. ID No. 5730
2738b	Seq. ID No. 5731	1518180	1518084	1516897	Seq. ID No. 5732
2738c	Seq. ID No. 5733	1518180	1518165	1516897	Seq. ID No. 5734
2738d	Seq. ID No. 5735	1518180	1518177	1516897	Seq. ID No. 5736
2742a	Seq. ID No. 5737	1518180	1518327	1518965	Seq. ID No. 5738
2742b	Seq. ID No. 5739	1518180	1518195	1518965	Seq. ID No. 5740

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2743a	Seq. ID No. 5741	1520031	1520013	1519519	Seq. ID No. 5742
2743b	Seq. ID No. 5743	1520031	1520022	1519519	Seq. ID No. 5744
2744	Seq. ID No. 5745	1520872	1520860	1520513	Seq. ID No. 5746
2745a	Seq. ID No. 5747	1519154	1519358	1520725	Seq. ID No. 5748
2745b	Seq. ID No. 5749	1519154	1519169	1520725	Seq. ID No. 5750
2746	Seq. ID No. 5751	1520820	1520832	1521431	Seq. ID No. 5752
2747a	Seq. ID No. 5753	1522209	1522173	1521472	Seq. ID No. 5754
2747b	Seq. ID No. 5755	1522209	1522209	1521472	Seq. ID No. 5756
2748a	Seq. ID No. 5757	1523583	1523526	1522213	Seq. ID No. 5758
2748b	Seq. ID No. 5759	1523583	1523568	1522213	Seq. ID No. 5760
2748c	Seq. ID No. 5761	1523583	1523571	1522213	Seq. ID No. 5762
2749a	Seq. ID No. 5763	1524727	1523995	1523705	Seq. ID No. 5764
2749b	Seq. ID No. 5765	1524727	1524178	1523705	Seq. ID No. 5766
2749c	Seq. ID No. 5767	1524727	1524541	1523705	Seq. ID No. 5768
2749d	Seq. ID No. 5769	1524727	1524631	1523705	Seq. ID No. 5770
2749e	Seq. ID No. 5771	1524727	1524721	1523705	Seq. ID No. 5772
2750a	Seq. ID No. 5773	1525364	1525289	1524954	Seq. ID No. 5774
2750b	Seq. ID No. 5775	1525364	1525319	1524954	Seq. ID No. 5776
2752	Seq. ID No. 5777	1525678	1525690	1527060	Seq. ID No. 5778
2753	Seq. ID No. 5779	1528083	1528029	1527202	Seq. ID No. 5780
2757a	Seq. ID No. 5781	1528638	1528524	1528156	Seq. ID No. 5782
2757b	Seq. ID No. 5783	1528638	1528623	1528156	Seq. ID No. 5784
2758a	Seq. ID No. 5785	1529611	1529440	1528613	Seq. ID No. 5786
2758b	Seq. ID No. 5787	1529611	1529485	1528613	Seq. ID No. 5788
2758c	Seq. ID No. 5789	1529611	1529497	1528613	Seq. ID No. 5790
2758d	Seq. ID No. 5791	1529611	1529581	1528613	Seq. ID No. 5792
2759a	Seq. ID No. 5793	1530134	1530053	1529427	Seq. ID No. 5794
2759b	Seq. ID No. 5795	1530134	1530134	1529427	Seq. ID No. 5796
2760a	Seq. ID No. 5797	1530993	1530369	1530127	Seq. ID No. 5798



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2760b	Seq. ID No. 5799	1530993	1530963	1530127	Seq. ID No. 5800
2760c	Seq. ID No. 5801	1530993	1530987	1530127	Seq. ID No. 5802
2762	Seq. ID No. 5803	1531820	1531820	1531293	Seq. ID No. 5804
2763a	Seq. ID No. 5805	1532723	1532576	1531821	Seq. ID No. 5806
2763b	Seq. ID No. 5807	1532723	1532588	1531821	Seq. ID No. 5808
2763c	Seq. ID No. 5809	1532723	1532666	1531821	Seq. ID No. 5810
2764	Seq. ID No. 5811	1533169	1533145	1532774	Seq. ID No. 5812
2765b	Seq. ID No. 5813	1533695	1533587	1533045	Seq. ID No. 5814
2765c	Seq. ID No. 5815	1533695	1533623	1533045	Seq. ID No. 5816
2766a	Seq. ID No. 5817	1535067	1535031	1533682	Seq. ID No. 5818
2766b	Seq. ID No. 5819	1535067	1535061	1533682	Seq. ID No. 5820
2768a	Seq. ID No. 5821	1536982	1536859	1535072	Seq. ID No. 5822
2768b	Seq. ID No. 5823	1536982	1536934	1535072	Seq. ID No. 5824
2768c	Seq. ID No. 5825	1536982	1536958	1535072	Seq. ID No. 5826
2769a	Seq. ID No. 5827	1535138	1535258	1535506	Seq. ID No. 5828
2770	Seq. ID No. 5829	1536567	1536576	1536812	Seq. ID No. 5830
2771a	Seq. ID No. 5831	1537982	1537820	1536999	Seq. ID No. 5832
2771b	Seq. ID No. 5833	1537982	1537907	1536999	Seq. ID No. 5834
2773	Seq. ID No. 5835	1539371	1539353	1538247	Seq. ID No. 5836
2774a	Seq. ID No. 5837	1540719	1540500	1539532	Seq. ID No. 5838
2774b	Seq. ID No. 5839	1540719	1540638	1539532	Seq. ID No. 5840
2774c	Seq. ID No. 5841	1540719	1540674	1539532	Seq. ID No. 5842
2776a	Seq. ID No. 5843	1541302	1541248	1540820	Seq. ID No. 5844
2776b	Seq. ID No. 5845	1541302	1541293	1540820	Seq. ID No. 5846
2777	Seq. ID No. 5847	1542467	1542467	1541280	Seq. ID No. 5848
2778	Seq. ID No. 5849	1543318	1543297	1542479	Seq. ID No. 5850
2779	Seq. ID No. 5851	1544480	1544465	1543347	Seq. ID No. 5852
2780	Seq. ID No. 5853	1545002	1545002	1544664	Seq. ID No. 5854
2784	Seq. ID No. 5855	1545859	1545892	1547058	Seq. ID No. 5856

TABLE 2: ALL CLAIMED ORFS

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2785a	Seq. ID No. 5857	1548736	1548439	1547480	Seq. ID No. 5858
2785b	Seq. ID No. 5859	1548736	1548700	1547480	Seq. ID No. 5860
2786a	Seq. ID No. 5861	1549210	1549273	1549941	Seq. ID No. 5862
2786b	Seq. ID No. 5863	1549210	1549219	1549941	Seq. ID No. 5864
2786c	Seq. ID No. 5865	1549210	1549210	1549941	Seq. ID No. 5866
2787a	Seq. ID No. 5867	1550972	1550930	1550007	Seq. ID No. 5868
2787b	Seq. ID No. 5869	1550972	1550948	1550007	Seq. ID No. 5870
2787c	Seq. ID No. 5871	1550972	1550969	1550007	Seq. ID No. 5872
2788b	Seq. ID No. 5873	1550131	1550137	1550595	Seq. ID No. 5874
2789	Seq. ID No. 5875	1552131	1552116	1550923	Seq. ID No. 5876
2790	Seq. ID No. 5877	1552550	1552550	1552113	Seq. ID No. 5878
2791	Seq. ID No. 5879	1552345	1552345	1552118	Seq. ID No. 5880
2793	Seq. ID No. 5881	1553495	1553474	1552551	Seq. ID No. 5882
2794	Seq. ID No. 5883	1553299	1553296	1553060	Seq. ID No. 5884
2796a	Seq. ID No. 5885	1554180	1554075	1553785	Seq. ID No. 5886
2798	Seq. ID No. 5887	1554325	1554301	1553969	Seq. ID No. 5888
2799a	Seq. ID No. 5889	1553810	1553918	1554184	Seq. ID No. 5890
2799b	Seq. ID No. 5891	1553810	1553822	1554184	Seq. ID No. 5892
2801a	Seq. ID No. 5893	1556543	1556078	1555158	Seq. ID No. 5894
2801b	Seq. ID No. 5895	1556543	1556471	1555158	Seq. ID No. 5896
2804	Seq. ID No. 5897	1557136	1557124	1556468	Seq. ID No. 5898
2805a	Seq. ID No. 5899	1558765	1557724	1557347	Seq. ID No. 5900
2805b	Seq. ID No. 5901	1558765	1558723	1557347	Seq. ID No. 5902
2809	Seq. ID No. 5903	1559388	1559373	1558726	Seq. ID No. 5904
2810a	Seq. ID No. 5905	1560847	1559776	1559384	Seq. ID No. 5906
2810b	Seq. ID No. 5907	1560847	1560571	1559384	Seq. ID No. 5908
2810c	Seq. ID No. 5909	1560847	1560772	1559384	Seq. ID No. 5910
2810d	Seq. ID No. 5911	1560847	1560826	1559384	Seq. ID No. 5912
2812	Seq. ID No. 5913	1562885	1562828	1561227	Seq. ID No. 5914

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2814	Seq. ID No. 5915	1563915	1563912	1563031	Seq. ID No. 5916
2815	Seq. ID No. 5917	1564857	1564806	1563925	Seq. ID No. 5918
2816	Seq. ID No. 5919	1565582	1565555	1564821	Seq. ID No. 5920
2818a	Seq. ID No. 5921	1567335	1565871	1565566	Seq. ID No. 5922
2818b	Seq. ID No. 5923	1567335	1566276	1565566	Seq. ID No. 5924
2818c	Seq. ID No. 5925	1567335	1567161	1565566	Seq. ID No. 5926
2818d	Seq. ID No. 5927	1567335	1567281	1565566	Seq. ID No. 5928
2818e	Seq. ID No. 5929	1567335	1567335	1565566	Seq. ID No. 5930
2819	Seq. ID No. 5931	1568219	1568195	1567689	Seq. ID No. 5932
2820	Seq. ID No. 5933	1569072	1569063	1568275	Seq. ID No. 5934
2821a	Seq. ID No. 5935	1570005	1569981	1569271	Seq. ID No. 5936
2821b	Seq. ID No. 5937	1570005	1570002	1569271	Seq. ID No. 5938
2822a	Seq. ID No. 5939	1571393	1570382	1570002	Seq. ID No. 5940
2822b	Seq. ID No. 5941	1571393	1571372	1570002	Seq. ID No. 5942
2823	Seq. ID No. 5943	1571696	1571675	1571394	Seq. ID No. 5944
2824a	Seq. ID No. 5945	1573753	1573744	1571678	Seq. ID No. 5946
2824b	Seq. ID No. 5947	1573753	1573753	1571678	Seq. ID No. 5948
2829a	Seq. ID No. 5949	1574248	1574341	1574763	Seq. ID No. 5950
2829b	Seq. ID No. 5951	1574248	1574260	1574763	Seq. ID No. 5952
2831b	Seq. ID No. 5953	1574873	1574897	1575280	Seq. ID No. 5954
2832	Seq. ID No. 5955	1575871	1575832	1575464	Seq. ID No. 5956
2833	Seq. ID No. 5957	1576608	1576584	1576153	Seq. ID No. 5958
2834a	Seq. ID No. 5959	1580917	1580884	1576613	Seq. ID No. 5960
2834b	Seq. ID No. 5961	1580917	1580917	1576613	Seq. ID No. 5962
2837a	Seq. ID No. 5963	1578356	1578371	1578688	Seq. ID No. 5964
2837b	Seq. ID No. 5965	1578356	1578356	1578688	Seq. ID No. 5966
2842a	Seq. ID No. 5967	1581713	1581578	1580898	Seq. ID No. 5968
2842b	Seq. ID No. 5969	1581713	1581665	1580898	Seq. ID No. 5970
2843a	Seq. ID No. 5971	1583065	1583050	1581806	Seq. ID No. 5972

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2843b	Seq. ID No. 5973	1583065	1583062	1581806	Seq. ID No. 5974
2845	Seq. ID No. 5975	1583130	1583130	1583053	Seq. ID No. 5976
2846a	Seq. ID No. 5977	1584739	1584682	1583180	Seq. ID No. 5978
2846b	Seq. ID No. 5979	1584739	1584736	1583180	Seq. ID No. 5980
2848	Seq. ID No. 5981	1585873	1585864	1585124	Seq. ID No. 5982
2850	Seq. ID No. 5983	1586969	1586951	1586739	Seq. ID No. 5984
2851	Seq. ID No. 5985	1588973	1588943	1587099	Seq. ID No. 5986
2852	Seq. ID No. 5987	1587816	1587849	1588103	Seq. ID No. 5988
2853	Seq. ID No. 5989	1589963	1589963	1588974	Seq. ID No. 5990
2854a	Seq. ID No. 5991	1590804	1590726	1590217	Seq. ID No. 5992
2854b	Seq. ID No. 5993	1590804	1590798	1590217	Seq. ID No. 5994
2855	Seq. ID No. 5995	1591410	1591476	1591931	Seq. ID No. 5996
2856a	Seq. ID No. 5997	1591867	1591996	1594047	Seq. ID No. 5998
2856b	Seq. ID No. 5999	1591867	1591945	1594047	Seq. ID No. 6000
2856c	Seq. ID No. 6001	1591867	1591900	1594047	Seq. ID No. 6002
2857	Seq. ID No. 6003	1595645	1595627	1594251	Seq. ID No. 6004
2859	Seq. ID No. 6005	1595626	1595626	1595733	Seq. ID No. 6006
2860a	Seq. ID No. 6007	1597299	1597131	1596229	Seq. ID No. 6008
2860b	Seq. ID No. 6009	1597299	1597275	1596229	Seq. ID No. 6010
2860c	Seq. ID No. 6011	1597299	1597293	1596229	Seq. ID No. 6012
2862	Seq. ID No. 6013	1596809	1596821	1597177	Seq. ID No. 6014
2863	Seq. ID No. 6015	1598748	1598733	1597300	Seq. ID No. 6016
2864	Seq. ID No. 6017	1600262	1600202	1598736	Seq. ID No. 6018
2868a	Seq. ID No. 6019	1600543	1600507	1600202	Seq. ID No. 6020
2868b	Seq. ID No. 6021	1600543	1600525	1600202	Seq. ID No. 6022
2869a	Seq. ID No. 6023	1601667	1601622	1600540	Seq. ID No. 6024
2869b	Seq. ID No. 6025	1601667	1601646	1600540	Seq. ID No. 6026
2869c	Seq. ID No. 6027	1601667	1601658	1600540	Seq. ID No. 6028
2871	Seq. ID No. 6029	1603689	1603686	1601668	Seq. ID No. 6030

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2872	Seq. ID No. 6031	1601990	1602041	1602271	Seq. ID No. 6032
2875	Seq. ID No. 6033	1605944	1605923	1603701	Seq. ID No. 6034
2877	Seq. ID No. 6035	1606804	1606738	1606094	Seq. ID No. 6036
2879a	Seq. ID No. 6037	1607607	1607562	1606828	Seq. ID No. 6038
2879b	Seq. ID No. 6039	1607607	1607583	1606828	Seq. ID No. 6040
2879c	Seq. ID No. 6041	1607607	1607607	1606828	Seq. ID No. 6042
2881	Seq. ID No. 6043	1608286	1608187	1607564	Seq. ID No. 6044
2882	Seq. ID No. 6045	1607771	1607807	1608046	Seq. ID No. 6046
2883a	Seq. ID No. 6047	1611163	1609828	1608341	Seq. ID No. 6048
2883b	Seq. ID No. 6049	1611163	1611025	1608341	Seq. ID No. 6050
2883c	Seq. ID No. 6051	1611163	1611046	1608341	Seq. ID No. 6052
2883d	Seq. ID No. 6053	1611163	1611157	1608341	Seq. ID No. 6054
2886a	Seq. ID No. 6055	1611898	1611889	1611185	Seq. ID No. 6056
2886b	Seq. ID No. 6057	1611898	1611898	1611185	Seq. ID No. 6058
2887a	Seq. ID No. 6059	1611006	1611216	1611500	Seq. ID No. 6060
2887b	Seq. ID No. 6061	1611006	1611024	1611500	Seq. ID No. 6062
2888	Seq. ID No. 6063	1611669	1611672	1611914	Seq. ID No. 6064
2890	Seq. ID No. 6065	1612042	1612057	1612656	Seq. ID No. 6066
2891a	Seq. ID No. 6067	1613956	1613311	1612760	Seq. ID No. 6068
2891b	Seq. ID No. 6069	1613956	1613935	1612760	Seq. ID No. 6070
2891c	Seq. ID No. 6071	1613956	1613944	1612760	Seq. ID No. 6072
2893b	Seq. ID No. 6073	1613327	1613333	1613815	Seq. ID No. 6074
2894a	Seq. ID No. 6075	1614952	1614535	1613957	Seq. ID No. 6076
2894b	Seq. ID No. 6077	1614952	1614928	1613957	Seq. ID No. 6078
2894c	Seq. ID No. 6079	1614952	1614931	1613957	Seq. ID No. 6080
2895	Seq. ID No. 6081	1614554	1614620	1614847	Seq. ID No. 6082
2897a	Seq. ID No. 6083	1616609	1616564	1615302	Seq. ID No. 6084
2897b	Seq. ID No. 6085	1616609	1616597	1615302	Seq. ID No. 6086
2900a	Seq. ID No. 6087	1618165	1618144	1617167	Seq. ID No. 6088

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2900b	Seq. ID No. 6089	1618165	1618150	1617167	Seq. ID No. 6090
2901a	Seq. ID No. 6091	1617668	1617746	1618075	Seq. ID No. 6092
2901b	Seq. ID No. 6093	1617668	1617680	1618075	Seq. ID No. 6094
2902	Seq. ID No. 6095	1619717	1619714	1618173	Seq. ID No. 6096
2904	Seq. ID No. 6097	1620381	1620264	1619935	Seq. ID No. 6098
2905a	Seq. ID No. 6099	1621305	1620918	1620382	Seq. ID No. 6100
2905b	Seq. ID No. 6101	1621305	1621284	1620382	Seq. ID No. 6102
2906	Seq. ID No. 6103	1623352	1623340	1621463	Seq. ID No. 6104
2909a	Seq. ID No. 6105	1625836	1625236	1623602	Seq. ID No. 6106
2909b	Seq. ID No. 6107	1625836	1625401	1623602	Seq. ID No. 6108
2909c	Seq. ID No. 6109	1625836	1625821	1623602	Seq. ID No. 6110
2909d	Seq. ID No. 6111	1625836	1625827	1623602	Seq. ID No. 6112
2912	Seq. ID No. 6113	1626173	1626179	1626469	Seq. ID No. 6114
2913a	Seq. ID No. 6115	1628027	1627994	1626564	Seq. ID No. 6116
2913b	Seq. ID No. 6117	1628027	1628021	1626564	Seq. ID No. 6118
2915a	Seq. ID No. 6119	1628740	1628713	1628024	Seq. ID No. 6120
2915b	Seq. ID No. 6121	1628740	1628725	1628024	Seq. ID No. 6122
2915c	Seq. ID No. 6123	1628740	1628740	1628024	Seq. ID No. 6124
2916	Seq. ID No. 6125	1629233	1629218	1628859	Seq. ID No. 6126
2917	Seq. ID No. 6127	1629566	1629566	1629375	Seq. ID No. 6128
2918	Seq. ID No. 6129	1631092	1631089	1629779	Seq. ID No. 6130
2920	Seq. ID No. 6131	1631506	1631473	1631243	Seq. ID No. 6132
2921	Seq. ID No. 6133	1632233	1632218	1631589	Seq. ID No. 6134
2922b	Seq. ID No. 6135	1631644	1631647	1631913	Seq. ID No. 6136
2923a	Seq. ID No. 6137	1633273	1632916	1632269	Seq. ID No. 6138
2923b	Seq. ID No. 6139	1633273	1633258	1632269	Seq. ID No. 6140
2923c	Seq. ID No. 6141	1633273	1633267	1632269	Seq. ID No. 6142
2925a	Seq. ID No. 6143	1634281	1634122	1633424	Seq. ID No. 6144
2925b	Seq. ID No. 6145	1634281	1634278	1633424	Seq. ID No. 6146

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2926a	Seq. ID No. 6147	1635443	1635365	1634265	Seq. ID No. 6148
2926b	Seq. ID No. 6149	1635443	1635383	1634265	Seq. ID No. 6150
2926c	Seq. ID No. 6151	1635443	1635437	1634265	Seq. ID No. 6152
2928a	Seq. ID No. 6153	1635990	1635924	1635358	Seq. ID No. 6154
2928b	Seq. ID No. 6155	1635990	1635954	1635358	Seq. ID No. 6156
2928c	Seq. ID No. 6157	1635990	1635963	1635358	Seq. ID No. 6158
2929b	Seq. ID No. 6159	1635214	1635241	1635663	Seq. ID No. 6160
2931a	Seq. ID No. 6161	1637677	1636687	1636097	Seq. ID No. 6162
2931b	Seq. ID No. 6163	1637677	1636831	1636097	Seq. ID No. 6164
2931c	Seq. ID No. 6165	1637677	1637605	1636097	Seq. ID No. 6166
2933a	Seq. ID No. 6167	1639308	1639119	1637683	Seq. ID No. 6168
2933b	Seq. ID No. 6169	1639308	1639299	1637683	Seq. ID No. 6170
2934	Seq. ID No. 6171	1640421	1640421	1639309	Seq. ID No. 6172
2935a	Seq. ID No. 6173	1641368	1641266	1640808	Seq. ID No. 6174
2935b	Seq. ID No. 6175	1641368	1641365	1640808	Seq. ID No. 6176
2936	Seq. ID No. 6177	1642293	1642278	1641352	Seq. ID No. 6178
2939a	Seq. ID No. 6179	1642920	1642842	1642435	Seq. ID No. 6180
2939b	Seq. ID No. 6181	1642920	1642902	1642435	Seq. ID No. 6182
2941a	Seq. ID No. 6183	1645387	1644805	1643459	Seq. ID No. 6184
2941b	Seq. ID No. 6185	1645387	1645246	1643459	Seq. ID No. 6186
2941c	Seq. ID No. 6187	1645387	1645318	1643459	Seq. ID No. 6188
2943a	Seq. ID No. 6189	1647063	1646619	1645318	Seq. ID No. 6190
2943b	Seq. ID No. 6191	1647063	1646910	1645318	Seq. ID No. 6192
2943c	Seq. ID No. 6193	1647063	1647036	1645318	Seq. ID No. 6194
2943d	Seq. ID No. 6195	1647063	1647042	1645318	Seq. ID No. 6196
2944b	Seq. ID No. 6197	1645364	1645379	1645759	Seq. ID No. 6198
2945b	Seq. ID No. 6199	1646411	1646414	1646893	Seq. ID No. 6200
2947	Seq. ID No. 6201	1647671	1647659	1647036	Seq. ID No. 6202
2948a	Seq. ID No. 6203	1648994	1648082	1647831	Seq. ID No. 6204

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2948b	Seq. ID No. 6205	1648994	1648781	1647831	Seq. ID No. 6206
2948c	Seq. ID No. 6207	1648994	1648886	1647831	Seq. ID No. 6208
2948d	Seq. ID No. 6209	1648994	1648985	1647831	Seq. ID No. 6210
2950a	Seq. ID No. 6211	1649095	1649113	1650147	Seq. ID No. 6212
2950b	Seq. ID No. 6213	1649095	1649095	1650147	Seq. ID No. 6214
2951	Seq. ID No. 6215	1650757	1650751	1650221	Seq. ID No. 6216
2952	Seq. ID No. 6217	1650135	1650153	1650560	Seq. ID No. 6218
2954	Seq. ID No. 6219	1650935	1650944	1651768	Seq. ID No. 6220
2955a	Seq. ID No. 6221	1653168	1652175	1651840	Seq. ID No. 6222
2955b	Seq. ID No. 6223	1653168	1652187	1651840	Seq. ID No. 6224
2955c	Seq. ID No. 6225	1653168	1652409	1651840	Seq. ID No. 6226
2955d	Seq. ID No. 6227	1653168	1652565	1651840	Seq. ID No. 6228
2955e	Seq. ID No. 6229	1653168	1652973	1651840	Seq. ID No. 6230
2955f	Seq. ID No. 6231	1653168	1653084	1651840	Seq. ID No. 6232
2955g	Seq. ID No. 6233	1653168	1653168	1651840	Seq. ID No. 6234
2957	Seq. ID No. 6235	1653355	1653376	1653993	Seq. ID No. 6236
2958a	Seq. ID No. 6237	1654895	1654766	1654368	Seq. ID No. 6238
2958b	Seq. ID No. 6239	1654895	1654856	1654368	Seq. ID No. 6240
2958c	Seq. ID No. 6241	1654895	1654880	1654368	Seq. ID No. 6242
2959	Seq. ID No. 6243	1653994	1653997	1654986	Seq. ID No. 6244
2960a	Seq. ID No. 6245	1655465	1655390	1655130	Seq. ID No. 6246
2962a	Seq. ID No. 6247	1654995	1655103	1655627	Seq. ID No. 6248
2962b	Seq. ID No. 6249	1654995	1654995	1655627	Seq. ID No. 6250
2963	Seq. ID No. 6251	1655942	1655954	1656421	Seq. ID No. 6252
2965a	Seq. ID No. 6253	1658340	1657503	1657087	Seq. ID No. 6254
2965b	Seq. ID No. 6255	1658340	1658307	1657087	Seq. ID No. 6256
2965c	Seq. ID No. 6257	1658340	1658325	1657087	Seq. ID No. 6258
2966	Seq. ID No. 6259	1658084	1658096	1658344	Seq. ID No. 6260
2967	Seq. ID No. 6261	1660896	1660872	1658707	Seq. ID No. 6262



TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2969	Seq. ID No. 6263	1661016	1661061	1661981	Seq. ID No. 6264
2970a	Seq. ID No. 6265	1663149	1662966	1662703	Seq. ID No. 6266
2970b	Seq. ID No. 6267	1663149	1662999	1662703	Seq. ID No. 6268
2971a	Seq. ID No. 6269	1661991	1662033	1662746	Seq. ID No. 6270
2971b	Seq. ID No. 6271	1661991	1661991	1662746	Seq. ID No. 6272
2974a	Seq. ID No. 6273	1662698	1663724	1663963	Seq. ID No. 6274
2974b	Seq. ID No. 6275	1662698	1662743	1663963	Seq. ID No. 6276
2975	Seq. ID No. 6277	1665419	1665395	1664037	Seq. ID No. 6278
2977a	Seq. ID No. 6279	1665491	1665566	1666129	Seq. ID No. 6280
2977b	Seq. ID No. 6281	1665491	1665506	1666129	Seq. ID No. 6282
2978a	Seq. ID No. 6283	1666409	1666355	1666131	Seq. ID No. 6284
2978b	Seq. ID No. 6285	1666409	1666364	1666131	Seq. ID No. 6286
2979	Seq. ID No. 6287	1666051	1666126	1666689	Seq. ID No. 6288
2980a	Seq. ID No. 6289	1668091	1667302	1666901	Seq. ID No. 6290
2980b	Seq. ID No. 6291	1668091	1667875	1666901	Seq. ID No. 6292
2980c	Seq. ID No. 6293	1668091	1667995	1666901	Seq. ID No. 6294
2980d	Seq. ID No. 6295	1668091	1668028	1666901	Seq. ID No. 6296
2980e	Seq. ID No. 6297	1668091	1668070	1666901	Seq. ID No. 6298
2984	Seq. ID No. 6299	1669334	1669304	1667970	Seq. ID No. 6300
2986a	Seq. ID No. 6301	1670826	1670514	1669684	Seq. ID No. 6302
2986b	Seq. ID No. 6303	1670826	1670706	1669684	Seq. ID No. 6304
2986c	Seq. ID No. 6305	1670826	1670790	1669684	Seq. ID No. 6306
2988a	Seq. ID No. 6307	1672193	1672121	1670793	Seq. ID No. 6308
2988b	Seq. ID No. 6309	1672193	1672148	1670793	Seq. ID No. 6310
2988c	Seq. ID No. 6311	1672193	1672154	1670793	Seq. ID No. 6312
2989	Seq. ID No. 6313	1672635	1672536	1672342	Seq. ID No. 6314
2990	Seq. ID No. 6315	1674173	1674143	1672551	Seq. ID No. 6316
2991a	Seq. ID No. 6317	1675155	1674828	1674154	Seq. ID No. 6318
2991b	Seq. ID No. 6319	1675155	1675080	1674154	Seq. ID No. 6320

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
2991c	Seq. ID No. 6321	1675155	1675140	1674154	Seq. ID No. 6322
2992	Seq. ID No. 6323	1675279	1675294	1675782	Seq. ID No. 6324
2993a	Seq. ID No. 6325	1676636	1676624	1675920	Seq. ID No. 6326
2993b	Seq. ID No. 6327	1676636	1676627	1675920	Seq. ID No. 6328
2995a	Seq. ID No. 6329	1677557	1677437	1676643	Seq. ID No. 6330
2995b	Seq. ID No. 6331	1677557	1677554	1676643	Seq. ID No. 6332
2997	Seq. ID No. 6333	1677875	1677869	1677558	Seq. ID No. 6334
2998a	Seq. ID No. 6335	1678755	1678617	1677862	Seq. ID No. 6336
2998b	Seq. ID No. 6337	1678755	1678701	1677862	Seq. ID No. 6338
2999	Seq. ID No. 6339	1679123	1679120	1678734	Seq. ID No. 6340
3001	Seq. ID No. 6341	1680254	1680221	1679229	Seq. ID No. 6342
3003	Seq. ID No. 6343	1680586	1680574	1680245	Seq. ID No. 6344
3005	Seq. ID No. 6345	1681275	1681266	1680622	Seq. ID No. 6346
3008a	Seq. ID No. 6347	1681972	1681849	1681283	Seq. ID No. 6348
3008b	Seq. ID No. 6349	1681972	1681879	1681283	Seq. ID No. 6350
3008c	Seq. ID No. 6351	1681972	1681882	1681283	Seq. ID No. 6352
3008d	Seq. ID No. 6353	1681972	1681936	1681283	Seq. ID No. 6354
3010a	Seq. ID No. 6355	1682354	1682306	1681995	Seq. ID No. 6356
3010b	Seq. ID No. 6357	1682354	1682315	1681995	Seq. ID No. 6358
3012	Seq. ID No. 6359	1684114	1684102	1682330	Seq. ID No. 6360
3015	Seq. ID No. 6361	1684647	1684692	1685450	Seq. ID No. 6362
3016a	Seq. ID No. 6363	1686951	1686111	1685629	Seq. ID No. 6364
3016b	Seq. ID No. 6365	1686951	1686861	1685629	Seq. ID No. 6366
3016c	Seq. ID No. 6367	1686951	1686930	1685629	Seq. ID No. 6368
3017	Seq. ID No. 6369	1687931	1687823	1686927	Seq. ID No. 6370
3018a	Seq. ID No. 6371	1688418	1688376	1687897	Seq. ID No. 6372
3018b	Seq. ID No. 6373	1688418	1688379	1687897	Seq. ID No. 6374
3020	Seq. ID No. 6375	1689300	1689261	1688419	Seq. ID No. 6376
3021	Seq. ID No. 6377	1689758	1689743	1689423	Seq. ID No. 6378

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
3022	Seq. ID No. 6379	1692324	1692324	1689814	Seq. ID No. 6380
3023	Seq. ID No. 6381	1689787	1689787	1690059	Seq. ID No. 6382
3024a	Seq. ID No. 6383	1691465	1691537	1691806	Seq. ID No. 6384
3024b	Seq. ID No. 6385	1691465	1691474	1691806	Seq. ID No. 6386
3026a	Seq. ID No. 6387	1692828	1692804	1692346	Seq. ID No. 6388
3026b	Seq. ID No. 6389	1692828	1692819	1692346	Seq. ID No. 6390
3028a	Seq. ID No. 6391	1693823	1693703	1693047	Seq. ID No. 6392
3028b	Seq. ID No. 6393	1693823	1693709	1693047	Seq. ID No. 6394
3028c	Seq. ID No. 6395	1693823	1693763	1693047	Seq. ID No. 6396
3029a	Seq. ID No. 6397	1694761	1694746	1693703	Seq. ID No. 6398
3029b	Seq. ID No. 6399	1694761	1694758	1693703	Seq. ID No. 6400
3031a	Seq. ID No. 6401	1695379	1695412	1695777	Seq. ID No. 6402
3031b	Seq. ID No. 6403	1695379	1695394	1695777	Seq. ID No. 6404
3032a	Seq. ID No. 6405	1696446	1696257	1696033	Seq. ID No. 6406
3032b	Seq. ID No. 6407	1696446	1696299	1696033	Seq. ID No. 6408
3033a	Seq. ID No. 6409	1697227	1697194	1696382	Seq. ID No. 6410
3033b	Seq. ID No. 6411	1697227	1697197	1696382	Seq. ID No. 6412
3035	Seq. ID No. 6413	1697987	1697987	1697232	Seq. ID No. 6414
3037a	Seq. ID No. 6415	1698709	1698781	1699263	Seq. ID No. 6416
3037b	Seq. ID No. 6417	1698709	1698739	1699263	Seq. ID No. 6418
3038	Seq. ID No. 6419	1699841	1699841	1700038	Seq. ID No. 6420
3040a	Seq. ID No. 6421	1701079	1700950	1700138	Seq. ID No. 6422
3040b	Seq. ID No. 6423	1701079	1701079	1700138	Seq. ID No. 6424
3042a	Seq. ID No. 6425	1700433	1700445	1700675	Seq. ID No. 6426
3042b	Seq. ID No. 6427	1700433	1700433	1700675	Seq. ID No. 6428
3043a	Seq. ID No. 6429	1701375	1701306	1701073	Seq. ID No. 6430
3043b	Seq. ID No. 6431	1701375	1701324	1701073	Seq. ID No. 6432
3044	Seq. ID No. 6433	1701638	1701617	1701321	Seq. ID No. 6434
3045a	Seq. ID No. 6435	1702055	1702040	1701639	Seq. ID No. 6436

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
3045b	Seq. ID No. 6437	1702055	1702043	1701639	Seq. ID No. 6438
3048a	Seq. ID No. 6439	1702494	1702383	1702033	Seq. ID No. 6440
3049a	Seq. ID No. 6441	1704304	1703878	1702388	Seq. ID No. 6442
3049b	Seq. ID No. 6443	1704304	1704055	1702388	Seq. ID No. 6444
3049c	Seq. ID No. 6445	1704304	1704289	1702388	Seq. ID No. 6446
3051a	Seq. ID No. 6447	1704655	1704649	1704305	Seq. ID No. 6448
3051b	Seq. ID No. 6449	1704655	1704655	1704305	Seq. ID No. 6450
3052	Seq. ID No. 6451	1706095	1706095	1704656	Seq. ID No. 6452
3054	Seq. ID No. 6453	1705443	1705446	1705685	Seq. ID No. 6454
3055a	Seq. ID No. 6455	1706386	1706362	1706096	Seq. ID No. 6456
3055b	Seq. ID No. 6457	1706386	1706383	1706096	Seq. ID No. 6458
3057	Seq. ID No. 6459	1708245	1708242	1706380	Seq. ID No. 6460
3059	Seq. ID No. 6461	1709019	1709007	1708246	Seq. ID No. 6462
3060	Seq. ID No. 6463	1711662	1711659	1709020	Seq. ID No. 6464
3061	Seq. ID No. 6465	1709528	1709528	1709259	Seq. ID No. 6466
3062	Seq. ID No. 6467	1709324	1709330	1710160	Seq. ID No. 6468
3063a	Seq. ID No. 6469	1710350	1710368	1710655	Seq. ID No. 6470
3063b	Seq. ID No. 6471	1710350	1710365	1710655	Seq. ID No. 6472
3064b	Seq. ID No. 6473	1710920	1710938	1711330	Seq. ID No. 6474
3065a	Seq. ID No. 6475	1712082	1711980	1711663	Seq. ID No. 6476
3065b	Seq. ID No. 6477	1712082	1711983	1711663	Seq. ID No. 6478
3066	Seq. ID No. 6479	1711331	1711412	1711774	Seq. ID No. 6480
3067	Seq. ID No. 6481	1712393	1712384	1712001	Seq. ID No. 6482
3068	Seq. ID No. 6483	1713000	1712988	1712401	Seq. ID No. 6484
3069	Seq. ID No. 6485	1713434	1713380	1712991	Seq. ID No. 6486
3071	Seq. ID No. 6487	1714045	1714003	1713764	Seq. ID No. 6488
3072a	Seq. ID No. 6489	1714353	1714293	1714000	Seq. ID No. 6490
3073	Seq. ID No. 6491	1714645	1714639	1714304	Seq. ID No. 6492
3074	Seq. ID No. 6493	1715783	1715780	1714785	Seq. ID No. 6494

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
3075	Seq. ID No. 6495	1716350	1716335	1715784	Seq. ID No. 6496
3076	Seq. ID No. 6497	1715964	1716024	1716341	Seq. ID No. 6498
3077a	Seq. ID No. 6499	1717443	1717344	1716424	Seq. ID No. 6500
3077b	Seq. ID No. 6501	1717443	1717425	1716424	Seq. ID No. 6502
3077c	Seq. ID No. 6503	1717443	1717443	1716424	Seq. ID No. 6504
3078	Seq. ID No. 6505	1718902	1718866	1717376	Seq. ID No. 6506
3079	Seq. ID No. 6507	1717769	1717769	1718020	Seq. ID No. 6508
3081a	Seq. ID No. 6509	1720200	1720161	1718881	Seq. ID No. 6510
3081b	Seq. ID No. 6511	1720200	1720179	1718881	Seq. ID No. 6512
3083c	Seq. ID No. 6513	1720609	1720570	1720154	Seq. ID No. 6514
3083d	Seq. ID No. 6515	1720609	1720588	1720154	Seq. ID No. 6516
3085	Seq. ID No. 6517	1720239	1720287	1720517	Seq. ID No. 6518
3086	Seq. ID No. 6519	1721223	1721223	1720798	Seq. ID No. 6520
3087a	Seq. ID No. 6521	1721741	1721516	1721220	Seq. ID No. 6522
3087c	Seq. ID No. 6523	1721741	1721729	1721220	Seq. ID No. 6524
3088	Seq. ID No. 6525	1722323	1722311	1721742	Seq. ID No. 6526
3089a	Seq. ID No. 6527	1722579	1722534	1722301	Seq. ID No. 6528
3089b	Seq. ID No. 6529	1722579	1722540	1722301	Seq. ID No. 6530
3090	Seq. ID No. 6531	1723087	1723024	1722710	Seq. ID No. 6532
3091	Seq. ID No. 6533	1723434	1723377	1723024	Seq. ID No. 6534
3092a	Seq. ID No. 6535	1726056	1726017	1723726	Seq. ID No. 6536
3092b	Seq. ID No. 6537	1726056	1726023	1723726	Seq. ID No. 6538
3095	Seq. ID No. 6539	1725374	1725374	1724937	Seq. ID No. 6540
3096a	Seq. ID No. 6541	1724735	1724747	1724995	Seq. ID No. 6542
3096b	Seq. ID No. 6543	1724735	1724738	1724995	Seq. ID No. 6544
3097	Seq. ID No. 6545	1726568	1726568	1726035	Seq. ID No. 6546
3098a	Seq. ID No. 6547	1728002	1727765	1726569	Seq. ID No. 6548
3098b	Seq. ID No. 6549	1728002	1727993	1726569	Seq. ID No. 6550
3098c	Seq. ID No. 6551	1728002	1728002	1726569	Seq. ID No. 6552

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
3099	Seq. ID No. 6553	1728681	1728669	1727986	Seq. ID No. 6554
3100a	Seq. ID No. 6555	1727960	1728044	1728307	Seq. ID No. 6556
3100b	Seq. ID No. 6557	1727960	1728017	1728307	Seq. ID No. 6558
3101	Seq. ID No. 6559	1729161	1729158	1728682	Seq. ID No. 6560
3102	Seq. ID No. 6561	1729471	1729429	1729220	Seq. ID No. 6562
3103b	Seq. ID No. 6563	1729917	1729917	1729426	Seq. ID No. 6564
3104	Seq. ID No. 6565	1730101	1730101	1729931	Seq. ID No. 6566
3105	Seq. ID No. 6567	1730458	1730434	1730144	Seq. ID No. 6568
3106	Seq. ID No. 6569	1730695	1730668	1730465	Seq. ID No. 6570
3107a	Seq. ID No. 6571	1731400	1731364	1731125	Seq. ID No. 6572
3107b	Seq. ID No. 6573	1731400	1731385	1731125	Seq. ID No. 6574
3108a	Seq. ID No. 6575	1730751	1730838	1731467	Seq. ID No. 6576
3108b	Seq. ID No. 6577	1730751	1730778	1731467	Seq. ID No. 6578
3109	Seq. ID No. 6579	1731554	1731557	1732228	Seq. ID No. 6580
3110a	Seq. ID No. 6581	1732232	1732322	1732933	Seq. ID No. 6582
3110b	Seq. ID No. 6583	1732232	1732244	1732933	Seq. ID No. 6584
3113	Seq. ID No. 6585	1733078	1733090	1734292	Seq. ID No. 6586
3116	Seq. ID No. 6587	1734912	1734921	1735769	Seq. ID No. 6588
3118a	Seq. ID No. 6589	1735601	1735763	1736248	Seq. ID No. 6590
3118b	Seq. ID No. 6591	1735601	1735673	1736248	Seq. ID No. 6592
3119a	Seq. ID No. 6593	1736902	1736743	1736339	Seq. ID No. 6594
3119b	Seq. ID No. 6595	1736902	1736782	1736339	Seq. ID No. 6596
3119c	Seq. ID No. 6597	1736902	1736809	1736339	Seq. ID No. 6598
3119d	Seq. ID No. 6599	1736902	1736848	1736339	Seq. ID No. 6600
3119e	Seq. ID No. 6601	1736902	1736863	1736339	Seq. ID No. 6602
3119f	Seq. ID No. 6603	1736902	1736872	1736339	Seq. ID No. 6604
3121	Seq. ID No. 6605	1736957	1736978	1737658	Seq. ID No. 6606
3122a	Seq. ID No. 6607	1739218	1739212	1738022	Seq. ID No. 6608
3122b	Seq. ID No. 6609	1739218	1739218	1738022	Seq. ID No. 6610

TABLE 2: ALL CLAIMED ORFs

ORF Number	DNA SEQ ID Number	ORF Start	Protein Start	ORF Stop	Protein SEQ ID Number
3123a	Seq. ID No. 6611	1741016	1740947	1739265	Seq. ID No. 6612
3123b	Seq. ID No. 6613	1741016	1741007	1739265	Seq. ID No. 6614
3124	Seq. ID No. 6615	1741584	1741551	1740970	Seq. ID No. 6616
3126	Seq. ID No. 6617	1742270	1742243	1741596	Seq. ID No. 6618
3129a	Seq. ID No. 6619	1742959	1742902	1742246	Seq. ID No. 6620
3129b	Seq. ID No. 6621	1742959	1742932	1742246	Seq. ID No. 6622
3131	Seq. ID No. 6623	1745173	1745167	1743977	Seq. ID No. 6624
3134a	Seq. ID No. 6625	1747570	1747468	1745222	Seq. ID No. 6626
3134b	Seq. ID No. 6627	1747570	1747507	1745222	Seq. ID No. 6628
3138	Seq. ID No. 6629	1748892	1748832	1747537	Seq. ID No. 6630
3140	Seq. ID No. 6631	1748324	1748327	1748560	Seq. ID No. 6632
3141	Seq. ID No. 6633	1750186	1750177	1748972	Seq. ID No. 6634
3145a	Seq. ID No. 6635	1752277	1752205	1750973	Seq. ID No. 6636
3145b	Seq. ID No. 6637	1752277	1752259	1750973	Seq. ID No. 6638
3145c	Seq. ID No. 6639	1752277	1752274	1750973	Seq. ID No. 6640
3147a	Seq. ID No. 6641	125	1754054	1752510	Seq. ID No. 6642
3147b	Seq. ID No. 6643	125	122	1752510	Seq. ID No. 6644
3147c	Seq. ID No. 6645	125	83	1752510	Seq. ID No. 6646
3149a	Seq. ID No. 6647	7	1754326	1754123	Seq. ID No. 6648
3150a	Seq. ID No. 6649	1753936	1754086	1754331	Seq. ID No. 6650

Listed in Table 3 are ORFs that have been identified using Signal P algorithm (i.e. Signal P value of "YES") were considered to be surface exposed. 250 ORFs met all four of the criteria of the SignalP program for having a signal peptide (listed as a 'YES' in the SignalP column). A subset of 208 of these ORFs was also predicted by the HMM SignalP software to contain a signal peptide (Signal peptide). Of these 208 ORFs, the PSORT program predicted 21 ORFs to be localized to the periplasm (Peri); 29 ORFs to be localized to the outer membrane (OM); 153 ORFs to be localized to the cytoplasmic inner membrane (IM); and 5 ORFs to be localized to the cytoplasm. Of the 42 ORFs predicted by HMM SignalP to be non-secretory proteins (Non-secretory protein), 6 ORFs

were predicted by PSORT to be localized to the periplasm and 7 ORFs were predicted by PSORT to be localized to the cytoplasm, 180 ORFs were predicted to be localized to the IM and 31 ORFs were predicted to be localized to the OM.

**TABLE 3: SIGNALP: YES**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>HMMSignalP</b>	<b>PSORT</b>
51c	Seq. ID No. 89	Seq. ID No. 90	Non-secretory protein	IM
69	Seq. ID No. 127	Seq. ID No. 128	Non-secretory protein	Cyto
73a	Seq. ID No. 131	Seq. ID No. 132	Signal peptide	Cyto
73b	Seq. ID No. 133	Seq. ID No. 134	Signal peptide	Cyto
87a	Seq. ID No. 161	Seq. ID No. 162	Signal peptide	OM
87b	Seq. ID No. 163	Seq. ID No. 164	Signal peptide	IM
109c	Seq. ID No. 213	Seq. ID No. 214	Signal peptide	IM
109d	Seq. ID No. 215	Seq. ID No. 216	Signal peptide	IM
114	Seq. ID No. 225	Seq. ID No. 226	Signal peptide	OM
129a	Seq. ID No. 249	Seq. ID No. 250	Signal peptide	IM
129b	Seq. ID No. 251	Seq. ID No. 252	Signal peptide	IM
145b	Seq. ID No. 287	Seq. ID No. 288	Signal peptide	IM
145c	Seq. ID No. 289	Seq. ID No. 290	Signal peptide	IM
179a	Seq. ID No. 369	Seq. ID No. 370	Non-secretory protein	IM
179b	Seq. ID No. 371	Seq. ID No. 372	Non-secretory protein	IM
180b	Seq. ID No. 375	Seq. ID No. 376	Signal peptide	IM
183a	Seq. ID No. 377	Seq. ID No. 378	Non-secretory protein	IM
245a	Seq. ID No. 497	Seq. ID No. 498	Signal peptide	IM
246a	Seq. ID No. 503	Seq. ID No. 504	Signal peptide	IM
246b	Seq. ID No. 505	Seq. ID No. 506	Signal peptide	IM
255b	Seq. ID No. 527	Seq. ID No. 528	Signal peptide	IM
264b	Seq. ID No. 549	Seq. ID No. 550	Signal peptide	IM
277c	Seq. ID No. 575	Seq. ID No. 576	Signal peptide	OM
297	Seq. ID No. 617	Seq. ID No. 618	Signal peptide	Peri
318a	Seq. ID No. 657	Seq. ID No. 658	Signal peptide	OM
318b	Seq. ID No. 659	Seq. ID No. 660	Signal peptide	OM



**TABLE 3: SIGNALP: YES**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>HMMSignalP</b>	<b>PSORT</b>
318c	Seq. ID No. 661	Seq. ID No. 662	Signal peptide	IM
324	Seq. ID No. 675	Seq. ID No. 676	Signal peptide	OM
342a	Seq. ID No. 715	Seq. ID No. 716	Signal peptide	IM
342b	Seq. ID No. 717	Seq. ID No. 718	Signal peptide	IM
349b	Seq. ID No. 745	Seq. ID No. 746	Signal peptide	OM
349c	Seq. ID No. 747	Seq. ID No. 748	Signal peptide	OM
352a	Seq. ID No. 755	Seq. ID No. 756	Signal peptide	IM
352b	Seq. ID No. 757	Seq. ID No. 758	Signal peptide	IM
352c	Seq. ID No. 759	Seq. ID No. 760	Signal peptide	IM
354a	Seq. ID No. 761	Seq. ID No. 762	Signal peptide	IM
356c	Seq. ID No. 773	Seq. ID No. 774	Non-secretory protein	IM
372d	Seq. ID No. 807	Seq. ID No. 808	Signal peptide	OM
448	Seq. ID No. 967	Seq. ID No. 968	Signal peptide	IM
451a	Seq. ID No. 973	Seq. ID No. 974	Non-secretory protein	Peri
451b	Seq. ID No. 975	Seq. ID No. 976	Non-secretory protein	Peri
464b	Seq. ID No. 1013	Seq. ID No. 1014	Signal peptide	IM
471a	Seq. ID No. 1025	Seq. ID No. 1026	Non-secretory protein	Cyto
471b	Seq. ID No. 1027	Seq. ID No. 1028	Non-secretory protein	Cyto
472f	Seq. ID No. 1039	Seq. ID No. 1040	Signal peptide	IM
492	Seq. ID No. 1075	Seq. ID No. 1076	Signal peptide	OM
499a	Seq. ID No. 1089	Seq. ID No. 1090	Non-secretory protein	IM
547a	Seq. ID No. 1195	Seq. ID No. 1196	Signal peptide	OM
547b	Seq. ID No. 1197	Seq. ID No. 1198	Signal peptide	IM
553c	Seq. ID No. 1207	Seq. ID No. 1208	Non-secretory protein	IM
571	Seq. ID No. 1239	Seq. ID No. 1240	Non-secretory protein	Peri
576a	Seq. ID No. 1243	Seq. ID No. 1244	Signal peptide	Peri
576b	Seq. ID No. 1245	Seq. ID No. 1246	Signal peptide	IM
587c	Seq. ID No. 1269	Seq. ID No. 1270	Signal peptide	IM
609a	Seq. ID No. 1315	Seq. ID No. 1316	Signal peptide	IM

TABLE 3: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT
609b	Seq. ID No. 1317	Seq. ID No. 1318	Signal peptide	IM
613d	Seq. ID No. 1331	Seq. ID No. 1332	Signal peptide	IM
631b	Seq. ID No. 1365	Seq. ID No. 1366	Signal peptide	IM
631c	Seq. ID No. 1367	Seq. ID No. 1368	Signal peptide	IM
631d	Seq. ID No. 1369	Seq. ID No. 1370	Signal peptide	IM
679a	Seq. ID No. 1445	Seq. ID No. 1446	Signal peptide	Cyto
679b	Seq. ID No. 1447	Seq. ID No. 1448	Signal peptide	IM
722a	Seq. ID No. 1513	Seq. ID No. 1514	Signal peptide	IM
722c	Seq. ID No. 1517	Seq. ID No. 1518	Signal peptide	IM
738a	Seq. ID No. 1545	Seq. ID No. 1546	Signal peptide	IM
738c	Seq. ID No. 1549	Seq. ID No. 1550	Non-secretory protein	IM
743b	Seq. ID No. 1561	Seq. ID No. 1562	Signal peptide	IM
746a	Seq. ID No. 1569	Seq. ID No. 1570	Non-secretory protein	IM
746b	Seq. ID No. 1571	Seq. ID No. 1572	Signal peptide	IM
754b	Seq. ID No. 1585	Seq. ID No. 1586	Signal peptide	IM
786b	Seq. ID No. 1643	Seq. ID No. 1644	Signal peptide	Peri
789c	Seq. ID No. 1653	Seq. ID No. 1654	Signal peptide	IM
794b	Seq. ID No. 1661	Seq. ID No. 1662	Signal peptide	OM
794c	Seq. ID No. 1663	Seq. ID No. 1664	Signal peptide	OM
826	Seq. ID No. 1707	Seq. ID No. 1708	Signal peptide	IM
837b	Seq. ID No. 1733	Seq. ID No. 1734	Signal peptide	IM
843	Seq. ID No. 1737	Seq. ID No. 1738	Signal peptide	IM
853b	Seq. ID No. 1755	Seq. ID No. 1756	Signal peptide	IM
859a	Seq. ID No. 1765	Seq. ID No. 1766	Signal peptide	IM
859b	Seq. ID No. 1767	Seq. ID No. 1768	Signal peptide	IM
862	Seq. ID No. 1775	Seq. ID No. 1776	Non-secretory protein	Peri
870	Seq. ID No. 1791	Seq. ID No. 1792	Signal peptide	OM
876	Seq. ID No. 1805	Seq. ID No. 1806	Signal peptide	Peri
931	Seq. ID No. 1875	Seq. ID No. 1876	Signal peptide	IM

TABLE 3: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT
977a	Seq. ID No. 1969	Seq. ID No. 1970	Signal peptide	OM
981a	Seq. ID No. 1981	Seq. ID No. 1982	Signal peptide	IM
1017c	Seq. ID No. 2053	Seq. ID No. 2054	Signal peptide	IM
1017d	Seq. ID No. 2055	Seq. ID No. 2056	Signal peptide	IM
1036a	Seq. ID No. 2087	Seq. ID No. 2088	Signal peptide	IM
1036b	Seq. ID No. 2089	Seq. ID No. 2090	Signal peptide	IM
1036c	Seq. ID No. 2091	Seq. ID No. 2092	Signal peptide	IM
1044a	Seq. ID No. 2105	Seq. ID No. 2106	Signal peptide	IM
1047b	Seq. ID No. 2115	Seq. ID No. 2116	Signal peptide	OM
1065a	Seq. ID No. 2149	Seq. ID No. 2150	Signal peptide	Peri
1065b	Seq. ID No. 2151	Seq. ID No. 2152	Signal peptide	Peri
1067	Seq. ID No. 2159	Seq. ID No. 2160	Signal peptide	OM
1077d	Seq. ID No. 2177	Seq. ID No. 2178	Signal peptide	IM
1141a	Seq. ID No. 2277	Seq. ID No. 2278	Non-secretory protein	Cyto
1146c	Seq. ID No. 2293	Seq. ID No. 2294	Signal peptide	IM
1155c	Seq. ID No. 2321	Seq. ID No. 2322	Signal peptide	IM
1167a	Seq. ID No. 2347	Seq. ID No. 2348	Signal peptide	Peri
1168	Seq. ID No. 2351	Seq. ID No. 2352	Signal peptide	Peri
1169a	Seq. ID No. 2353	Seq. ID No. 2354	Signal peptide	IM
1172	Seq. ID No. 2365	Seq. ID No. 2366	Signal peptide	IM
1182b	Seq. ID No. 2395	Seq. ID No. 2396	Non-secretory protein	IM
1192b	Seq. ID No. 2421	Seq. ID No. 2422	Signal peptide	IM
1196a	Seq. ID No. 2425	Seq. ID No. 2426	Signal peptide	Peri
1196b	Seq. ID No. 2427	Seq. ID No. 2428	Signal peptide	Peri
1197	Seq. ID No. 2429	Seq. ID No. 2430	Signal peptide	IM
1207	Seq. ID No. 2449	Seq. ID No. 2450	Signal peptide	OM
1212	Seq. ID No. 2459	Seq. ID No. 2460	Signal peptide	IM
1237	Seq. ID No. 2525	Seq. ID No. 2526	Signal peptide	OM
1241a	Seq. ID No. 2531	Seq. ID No. 2532	Signal peptide	IM

TABLE 3: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT
1268b	Seq. ID No. 2607	Seq. ID No. 2608	Signal peptide	IM
1288	Seq. ID No. 2651	Seq. ID No. 2652	Signal peptide	IM
1308a	Seq. ID No. 2679	Seq. ID No. 2680	Signal peptide	IM
1315	Seq. ID No. 2693	Seq. ID No. 2694	Signal peptide	IM
1318	Seq. ID No. 2699	Seq. ID No. 2700	Signal peptide	IM
1319b	Seq. ID No. 2703	Seq. ID No. 2704	Signal peptide	IM
1348	Seq. ID No. 2753	Seq. ID No. 2754	Non-secretory protein	IM
1366a	Seq. ID No. 2785	Seq. ID No. 2786	Signal peptide	Peri
1381b	Seq. ID No. 2813	Seq. ID No. 2814	Signal peptide	IM
1387a	Seq. ID No. 2829	Seq. ID No. 2830	Non-secretory protein	OM
1393a	Seq. ID No. 2835	Seq. ID No. 2836	Signal peptide	Peri
1393d	Seq. ID No. 2841	Seq. ID No. 2842	Signal peptide	IM
1412a	Seq. ID No. 2879	Seq. ID No. 2880	Non-secretory protein	IM
1412b	Seq. ID No. 2881	Seq. ID No. 2882	Signal peptide	IM
1438	Seq. ID No. 2935	Seq. ID No. 2936	Signal peptide	OM
1439a	Seq. ID No. 2937	Seq. ID No. 2938	Signal peptide	IM
1440b	Seq. ID No. 2949	Seq. ID No. 2950	Signal peptide	IM
1446a	Seq. ID No. 2965	Seq. ID No. 2966	Non-secretory protein	IM
1446b	Seq. ID No. 2967	Seq. ID No. 2968	Non-secretory protein	IM
1448	Seq. ID No. 2973	Seq. ID No. 2974	Signal peptide	IM
1463a	Seq. ID No. 3007	Seq. ID No. 3008	Signal peptide	IM
1463b	Seq. ID No. 3009	Seq. ID No. 3010	Signal peptide	IM
1463c	Seq. ID No. 3011	Seq. ID No. 3012	Signal peptide	IM
1470a	Seq. ID No. 3029	Seq. ID No. 3030	Signal peptide	IM
1470b	Seq. ID No. 3031	Seq. ID No. 3032	Signal peptide	IM
1503a	Seq. ID No. 3109	Seq. ID No. 3110	Non-secretory protein	IM
1503b	Seq. ID No. 3111	Seq. ID No. 3112	Non-secretory protein	IM
1559a	Seq. ID No. 3219	Seq. ID No. 3220	Signal peptide	IM
1563	Seq. ID No. 3223	Seq. ID No. 3224	Non-secretory protein	Cyto

TABLE 3: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT
1584	Seq. ID No. 3273	Seq. ID No. 3274	Non-secretory protein	Peri
1594a	Seq. ID No. 3297	Seq. ID No. 3298	Signal peptide	IM
1612	Seq. ID No. 3331	Seq. ID No. 3332	Signal peptide	IM
1616b	Seq. ID No. 3335	Seq. ID No. 3336	Signal peptide	IM
1622a	Seq. ID No. 3341	Seq. ID No. 3342	Non-secretory protein	Cyto
1624	Seq. ID No. 3349	Seq. ID No. 3350	Signal peptide	Peri
1625b	Seq. ID No. 3353	Seq. ID No. 3354	Signal peptide	IM
1625c	Seq. ID No. 3355	Seq. ID No. 3356	Signal peptide	IM
1634c	Seq. ID No. 3377	Seq. ID No. 3378	Signal peptide	IM
1646b	Seq. ID No. 3391	Seq. ID No. 3392	Signal peptide	IM
1659c	Seq. ID No. 3425	Seq. ID No. 3426	Signal peptide	IM
1673a	Seq. ID No. 3449	Seq. ID No. 3450	Signal peptide	IM
1688b	Seq. ID No. 3493	Seq. ID No. 3494	Signal peptide	IM
1718b	Seq. ID No. 3573	Seq. ID No. 3574	Signal peptide	Cyto
1743	Seq. ID No. 3611	Seq. ID No. 3612	Signal peptide	IM
1747	Seq. ID No. 3619	Seq. ID No. 3620	Signal peptide	IM
1784b	Seq. ID No. 3689	Seq. ID No. 3690	Signal peptide	IM
1808a	Seq. ID No. 3753	Seq. ID No. 3754	Signal peptide	IM
1808b	Seq. ID No. 3755	Seq. ID No. 3756	Signal peptide	IM
1809c	Seq. ID No. 3765	Seq. ID No. 3766	Signal peptide	IM
1812a	Seq. ID No. 3781	Seq. ID No. 3782	Signal peptide	IM
1812b	Seq. ID No. 3783	Seq. ID No. 3784	Signal peptide	IM
1842b	Seq. ID No. 3851	Seq. ID No. 3852	Signal peptide	IM
1862a	Seq. ID No. 3903	Seq. ID No. 3904	Signal peptide	IM
1919a	Seq. ID No. 4005	Seq. ID No. 4006	Signal peptide	Peri
1919b	Seq. ID No. 4007	Seq. ID No. 4008	Signal peptide	IM
1931b	Seq. ID No. 4027	Seq. ID No. 4028	Signal peptide	IM
1946b	Seq. ID No. 4073	Seq. ID No. 4074	Signal peptide	IM
1973	Seq. ID No. 4137	Seq. ID No. 4138	Signal peptide	OM

TABLE 3: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT
1977a	Seq. ID No. 4141	Seq. ID No. 4142	Signal peptide	OM
1977b	Seq. ID No. 4143	Seq. ID No. 4144	Signal peptide	OM
1977c	Seq. ID No. 4145	Seq. ID No. 4146	Signal peptide	OM
2016c	Seq. ID No. 4225	Seq. ID No. 4226	Signal peptide	IM
2074b	Seq. ID No. 4343	Seq. ID No. 4344	Signal peptide	OM
2096a	Seq. ID No. 4385	Seq. ID No. 4386	Signal peptide	IM
2101	Seq. ID No. 4399	Seq. ID No. 4400	Signal peptide	Peri
2140a	Seq. ID No. 4469	Seq. ID No. 4470	Signal peptide	IM
2147a	Seq. ID No. 4483	Seq. ID No. 4484	Signal peptide	IM
2150a	Seq. ID No. 4493	Seq. ID No. 4494	Signal peptide	IM
2150b	Seq. ID No. 4495	Seq. ID No. 4496	Signal peptide	IM
2165	Seq. ID No. 4533	Seq. ID No. 4534	Signal peptide	IM
2245	Seq. ID No. 4699	Seq. ID No. 4700	Non-secretory protein	OM
2253b	Seq. ID No. 4709	Seq. ID No. 4710	Signal peptide	IM
2253c	Seq. ID No. 4711	Seq. ID No. 4712	Signal peptide	IM
2264a	Seq. ID No. 4735	Seq. ID No. 4736	Non-secretory protein	Peri
2308	Seq. ID No. 4827	Seq. ID No. 4828	Signal peptide	OM
2329b	Seq. ID No. 4871	Seq. ID No. 4872	Signal peptide	IM
2329c	Seq. ID No. 4873	Seq. ID No. 4874	Signal peptide	IM
2331	Seq. ID No. 4879	Seq. ID No. 4880	Non-secretory protein	IM
2358	Seq. ID No. 4921	Seq. ID No. 4922	Signal peptide	IM
2386b	Seq. ID No. 4981	Seq. ID No. 4982	Non-secretory protein	IM
2453	Seq. ID No. 5115	Seq. ID No. 5116	Signal peptide	OM
2518a	Seq. ID No. 5267	Seq. ID No. 5268	Signal peptide	Cyto
2550c	Seq. ID No. 5341	Seq. ID No. 5342	Signal peptide	IM
2567b	Seq. ID No. 5387	Seq. ID No. 5388	Signal peptide	IM
2616d	Seq. ID No. 5465	Seq. ID No. 5466	Signal peptide	IM
2616e	Seq. ID No. 5467	Seq. ID No. 5468	Non-secretory protein	IM
2618a	Seq. ID No. 5479	Seq. ID No. 5480	Non-secretory protein	IM

TABLE 3: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT
2625a	Seq. ID No. 5497	Seq. ID No. 5498	Signal peptide	Peri
2629b	Seq. ID No. 5513	Seq. ID No. 5514	Signal peptide	OM
2648a	Seq. ID No. 5543	Seq. ID No. 5544	Signal peptide	IM
2648b	Seq. ID No. 5545	Seq. ID No. 5546	Signal peptide	IM
2659b	Seq. ID No. 5567	Seq. ID No. 5568	Non-secretory protein	IM
2669a	Seq. ID No. 5587	Seq. ID No. 5588	Signal peptide	Peri
2669b	Seq. ID No. 5589	Seq. ID No. 5590	Signal peptide	IM
2669c	Seq. ID No. 5591	Seq. ID No. 5592	Signal peptide	IM
2679b	Seq. ID No. 5611	Seq. ID No. 5612	Signal peptide	IM
2680c	Seq. ID No. 5621	Seq. ID No. 5622	Signal peptide	IM
2689b	Seq. ID No. 5641	Seq. ID No. 5642	Signal peptide	Peri
2718a	Seq. ID No. 5681	Seq. ID No. 5682	Signal peptide	IM
2734a	Seq. ID No. 5719	Seq. ID No. 5720	Signal peptide	IM
2749e	Seq. ID No. 5771	Seq. ID No. 5772	Signal peptide	IM
2757b	Seq. ID No. 5783	Seq. ID No. 5784	Signal peptide	IM
2801b	Seq. ID No. 5895	Seq. ID No. 5896	Signal peptide	IM
2805a	Seq. ID No. 5899	Seq. ID No. 5900	Signal peptide	IM
2805b	Seq. ID No. 5901	Seq. ID No. 5902	Signal peptide	IM
2818d	Seq. ID No. 5927	Seq. ID No. 5928	Signal peptide	IM
2818e	Seq. ID No. 5929	Seq. ID No. 5930	Signal peptide	IM
2822a	Seq. ID No. 5939	Seq. ID No. 5940	Signal peptide	IM
2852	Seq. ID No. 5987	Seq. ID No. 5988	Non-secretory protein	IM
2862	Seq. ID No. 6013	Seq. ID No. 6014	Non-secretory protein	Cyto
2900a	Seq. ID No. 6087	Seq. ID No. 6088	Signal peptide	Peri
2900b	Seq. ID No. 6089	Seq. ID No. 6090	Signal peptide	Peri
2901a	Seq. ID No. 6091	Seq. ID No. 6092	Signal peptide	IM
2901b	Seq. ID No. 6093	Seq. ID No. 6094	Non-secretory protein	IM
2902	Seq. ID No. 6095	Seq. ID No. 6096	Signal peptide	IM
2906	Seq. ID No. 6103	Seq. ID No. 6104	Signal peptide	IM

TABLE 3: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT
2933b	Seq. ID No. 6169	Seq. ID No. 6170	Signal peptide	IM
2941b	Seq. ID No. 6185	Seq. ID No. 6186	Signal peptide	IM
2941c	Seq. ID No. 6187	Seq. ID No. 6188	Signal peptide	IM
2943d	Seq. ID No. 6195	Seq. ID No. 6196	Non-secretory protein	IM
2944b	Seq. ID No. 6197	Seq. ID No. 6198	Signal peptide	IM
2948a	Seq. ID No. 6203	Seq. ID No. 6204	Signal peptide	IM
2948b	Seq. ID No. 6205	Seq. ID No. 6206	Signal peptide	IM
2955a	Seq. ID No. 6221	Seq. ID No. 6222	Signal peptide	IM
2955b	Seq. ID No. 6223	Seq. ID No. 6224	Signal peptide	IM
2955e	Seq. ID No. 6229	Seq. ID No. 6230	Signal peptide	IM
2980b	Seq. ID No. 6291	Seq. ID No. 6292	Non-secretory protein	IM
3037a	Seq. ID No. 6415	Seq. ID No. 6416	Signal peptide	OM
3037b	Seq. ID No. 6417	Seq. ID No. 6418	Non-secretory protein	IM
3064b	Seq. ID No. 6473	Seq. ID No. 6474	Signal peptide	Peri
3079	Seq. ID No. 6507	Seq. ID No. 6508	Non-secretory protein	IM
3096b	Seq. ID No. 6543	Seq. ID No. 6544	Signal peptide	IM
3119b	Seq. ID No. 6595	Seq. ID No. 6596	Signal peptide	IM
3119c	Seq. ID No. 6597	Seq. ID No. 6598	Signal peptide	IM
3119d	Seq. ID No. 6599	Seq. ID No. 6600	Signal peptide	IM
3119e	Seq. ID No. 6601	Seq. ID No. 6602	Signal peptide	IM
3119f	Seq. ID No. 6603	Seq. ID No. 6604	Signal peptide	IM

Listed in Table 4 are all 526 ORFs of the SignalP program that met only three of the criteria of having a signal peptide (listed as a 'yes' in the SignalP column). A subset of 359 of these ORFs was also predicted by the HMM SignalP software to contain a signal peptide. Of these 359 ORFs, the PSORT program predicted 24 ORFs to be localized to the periplasm (Peri); 44 ORFs to be localized to the outer membrane (OM); 267 ORFs to be localized to the cytoplasmic membrane (IM); and 24 ORFs to be localized to the cytoplasm. Of the 167 ORFs predicted by HMM SignalP to be Non-secretory proteins, PSORT predicted 6 ORFs to be localized to the periplasm; 1 ORF to



be localized to the outer membrane; 122 ORFs to be localized to the cytoplasmic membrane; and 38 ORFs to be localized to the cytoplasm. Also listed for all ORFs is the predicted number of transmembrane,  $\alpha$ -helical hydrophobic domains predicted by the TopPred2 software (listed in the MSD column). If no value is listed, none has yet been determined. (The same is also the case for Tables 5 and 6).

**TABLE 4: SIGNALP: YES**

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
4a	Seq. ID No. 7	Seq. ID No. 8	Signal peptide	IM	4
4c	Seq. ID No. 11	Seq. ID No. 12	Non-secretory protein	IM	12
16	Seq. ID No. 23	Seq. ID No. 24	Non-secretory protein	IM	0
38a	Seq. ID No. 45	Seq. ID No. 46	Signal peptide	OM	1
38b	Seq. ID No. 47	Seq. ID No. 48	Signal peptide	OM	1
40	Seq. ID No. 53	Seq. ID No. 54	Signal peptide	IM	1
41c	Seq. ID No. 59	Seq. ID No. 60	Non-secretory protein	IM	1
44a	Seq. ID No. 65	Seq. ID No. 66	Signal peptide	IM	2
44b	Seq. ID No. 67	Seq. ID No. 68	Signal peptide	IM	2
51b	Seq. ID No. 87	Seq. ID No. 88	Signal peptide	IM	9
55	Seq. ID No. 91	Seq. ID No. 92	Non-secretory protein	IM	1
79	Seq. ID No. 139	Seq. ID No. 140	Non-secretory protein	IM	2
83	Seq. ID No. 151	Seq. ID No. 152	Non-secretory protein	IM	2
86	Seq. ID No. 159	Seq. ID No. 160	Signal peptide	Peri	1
87c	Seq. ID No. 165	Seq. ID No. 166	Non-secretory protein	IM	2
89	Seq. ID No. 169	Seq. ID No. 170	Non-secretory protein	IM	2
94	Seq. ID No. 185	Seq. ID No. 186	Non-secretory protein	IM	2
109b	Seq. ID No. 211	Seq. ID No. 212	Signal peptide	IM	7
111a	Seq. ID No. 217	Seq. ID No. 218	Signal peptide	IM	6
124a	Seq. ID No. 235	Seq. ID No. 236	Signal peptide	IM	1
124b	Seq. ID No. 237	Seq. ID No. 238	Signal peptide	IM	3
124c	Seq. ID No. 239	Seq. ID No. 240	Non-secretory protein	IM	5
138a	Seq. ID No. 271	Seq. ID No. 272	Signal peptide	IM	6

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
145a	Seq. ID No. 285	Seq. ID No. 286	Signal peptide	IM	3
145d	Seq. ID No. 291	Seq. ID No. 292	Non-secretory protein	IM	12
162a	Seq. ID No. 327	Seq. ID No. 328	Signal peptide	IM	2
170	Seq. ID No. 349	Seq. ID No. 350	Non-secretory protein	IM	1
187a	Seq. ID No. 385	Seq. ID No. 386	Non-secretory protein	IM	1
187b	Seq. ID No. 387	Seq. ID No. 388	Non-secretory protein	IM	1
196	Seq. ID No. 407	Seq. ID No. 408	Non-secretory protein	Cyto	1
205	Seq. ID No. 427	Seq. ID No. 428	Non-secretory protein	Cyto	
207	Seq. ID No. 431	Seq. ID No. 432	Non-secretory protein	IM	0
223a	Seq. ID No. 455	Seq. ID No. 456	Signal peptide	Cyto	1
223b	Seq. ID No. 457	Seq. ID No. 458	Signal peptide	Cyto	1
241	Seq. ID No. 495	Seq. ID No. 496	Signal peptide	IM	1
245b	Seq. ID No. 499	Seq. ID No. 500	Signal peptide	IM	10
248b	Seq. ID No. 511	Seq. ID No. 512	Signal peptide	IM	9
249a	Seq. ID No. 513	Seq. ID No. 514	Signal peptide	OM	1
249b	Seq. ID No. 515	Seq. ID No. 516	Signal peptide	IM	1
255a	Seq. ID No. 525	Seq. ID No. 526	Signal peptide	IM	6
263a	Seq. ID No. 545	Seq. ID No. 546	Signal peptide	OM	1
263b	Seq. ID No. 547	Seq. ID No. 548	Signal peptide	IM	1
268	Seq. ID No. 557	Seq. ID No. 558	Signal peptide	Cyto	1
273b	Seq. ID No. 569	Seq. ID No. 570	Signal peptide	IM	12
282	Seq. ID No. 589	Seq. ID No. 590	Non-secretory protein	Cyto	
283a	Seq. ID No. 591	Seq. ID No. 592	Signal peptide	OM	1
283b	Seq. ID No. 593	Seq. ID No. 594	Signal peptide	OM	1
284a	Seq. ID No. 595	Seq. ID No. 596	Non-secretory protein	IM	5
290b	Seq. ID No. 609	Seq. ID No. 610	Non-secretory protein	IM	
311	Seq. ID No. 637	Seq. ID No. 638	Signal peptide	IM	6
313a	Seq. ID No. 639	Seq. ID No. 640	Signal peptide	IM	2
313b	Seq. ID No. 641	Seq. ID No. 642	Signal peptide	IM	3

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
317a	Seq. ID No. 653	Seq. ID No. 654	Signal peptide	IM	2
321	Seq. ID No. 669	Seq. ID No. 670	Signal peptide	OM	1
327b	Seq. ID No. 679	Seq. ID No. 680	Signal peptide	IM	5
342c	Seq. ID No. 719	Seq. ID No. 720	Signal peptide	IM	4
342e	Seq. ID No. 723	Seq. ID No. 724	Signal peptide	IM	10
346b	Seq. ID No. 739	Seq. ID No. 740	Non-secretory protein	Cyto	0
350a	Seq. ID No. 749	Seq. ID No. 750	Signal peptide	IM	6
350b	Seq. ID No. 751	Seq. ID No. 752	Signal peptide	IM	6
354b	Seq. ID No. 763	Seq. ID No. 764	Signal peptide	IM	6
354c	Seq. ID No. 765	Seq. ID No. 766	Signal peptide	IM	6
356a	Seq. ID No. 769	Seq. ID No. 770	Signal peptide	IM	3
358a	Seq. ID No. 777	Seq. ID No. 778	Signal peptide	IM	3
358b	Seq. ID No. 779	Seq. ID No. 780	Signal peptide	IM	10
358c	Seq. ID No. 781	Seq. ID No. 782	Signal peptide	IM	10
382b	Seq. ID No. 819	Seq. ID No. 820	Signal peptide	OM	1
418b	Seq. ID No. 895	Seq. ID No. 896	Non-secretory protein	IM	7
420a	Seq. ID No. 903	Seq. ID No. 904	Non-secretory protein	IM	1
420b	Seq. ID No. 905	Seq. ID No. 906	Non-secretory protein	IM	1
422	Seq. ID No. 909	Seq. ID No. 910	Non-secretory protein	Cyto	
431	Seq. ID No. 935	Seq. ID No. 936	Signal peptide	OM	1
434	Seq. ID No. 937	Seq. ID No. 938	Signal peptide	IM	2
440	Seq. ID No. 951	Seq. ID No. 952	Non-secretory protein	IM	2
441b	Seq. ID No. 955	Seq. ID No. 956	Signal peptide	IM	2
452b	Seq. ID No. 979	Seq. ID No. 980	Signal peptide	IM	4
452c	Seq. ID No. 981	Seq. ID No. 982	Signal peptide	IM	4
452d	Seq. ID No. 983	Seq. ID No. 984	Signal peptide	IM	4
452e	Seq. ID No. 985	Seq. ID No. 986	Signal peptide	IM	4
462	Seq. ID No. 1005	Seq. ID No. 1006	Signal peptide	Peri	1
463a	Seq. ID No. 1007	Seq. ID No. 1008	Signal peptide	Peri	1

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
463b	Seq. ID No. 1009	Seq. ID No. 1010	Signal peptide	Peri	1
464c	Seq. ID No. 1015	Seq. ID No. 1016	Signal peptide	IM	11
465b	Seq. ID No. 1019	Seq. ID No. 1020	Signal peptide	OM	3
472a	Seq. ID No. 1029	Seq. ID No. 1030	Signal peptide	IM	4
472b	Seq. ID No. 1031	Seq. ID No. 1032	Signal peptide	IM	5
477b	Seq. ID No. 1047	Seq. ID No. 1048	Non-secretory protein	Cyto	0
499b	Seq. ID No. 1091	Seq. ID No. 1092	Non-secretory protein	IM	2
510	Seq. ID No. 1111	Seq. ID No. 1112	Non-secretory protein	Cyto	
524b	Seq. ID No. 1137	Seq. ID No. 1138	Signal peptide	IM	6
530a	Seq. ID No. 1151	Seq. ID No. 1152	Signal peptide	IM	
530b	Seq. ID No. 1153	Seq. ID No. 1154	Non-secretory protein	Peri	
541c	Seq. ID No. 1169	Seq. ID No. 1170	Signal peptide	IM	5
542	Seq. ID No. 1173	Seq. ID No. 1174	Signal peptide	IM	1
545a	Seq. ID No. 1183	Seq. ID No. 1184	Signal peptide	IM	3
546b	Seq. ID No. 1191	Seq. ID No. 1192	Non-secretory protein	IM	1
546c	Seq. ID No. 1193	Seq. ID No. 1194	Non-secretory protein	IM	1
556	Seq. ID No. 1213	Seq. ID No. 1214	Signal peptide	IM	2
561	Seq. ID No. 1223	Seq. ID No. 1224	Signal peptide	IM	5
564b	Seq. ID No. 1229	Seq. ID No. 1230	Signal peptide	IM	4
578a	Seq. ID No. 1247	Seq. ID No. 1248	Non-secretory protein	Cyto	0
585b	Seq. ID No. 1259	Seq. ID No. 1260	Signal peptide	Cyto	0
595a	Seq. ID No. 1283	Seq. ID No. 1284	Signal peptide	IM	2
603a	Seq. ID No. 1307	Seq. ID No. 1308	Non-secretory protein	Cyto	1
610a	Seq. ID No. 1319	Seq. ID No. 1320	Signal peptide	IM	1
610b	Seq. ID No. 1321	Seq. ID No. 1322	Non-secretory protein	IM	1
613b	Seq. ID No. 1327	Seq. ID No. 1328	Signal peptide	IM	7
619a	Seq. ID No. 1341	Seq. ID No. 1342	Signal peptide	Cyto	1
619b	Seq. ID No. 1343	Seq. ID No. 1344	Signal peptide	Cyto	1
623	Seq. ID No. 1347	Seq. ID No. 1348	Signal peptide	Peri	1

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
640	Seq. ID No. 1389	Seq. ID No. 1390	Non-secretory protein	Cyto	0
645	Seq. ID No. 1401	Seq. ID No. 1402	Signal peptide	Peri	1
665	Seq. ID No. 1429	Seq. ID No. 1430	Signal peptide	IM	3
699b	Seq. ID No. 1479	Seq. ID No. 1480	Non-secretory protein	IM	1
739	Seq. ID No. 1551	Seq. ID No. 1552	Signal peptide	IM	2
743a	Seq. ID No. 1559	Seq. ID No. 1560	Signal peptide	IM	2
749	Seq. ID No. 1579	Seq. ID No. 1580	Signal peptide	IM	1
754c	Seq. ID No. 1587	Seq. ID No. 1588	Non-secretory protein	IM	.9
772a	Seq. ID No. 1621	Seq. ID No. 1622	Signal peptide	IM	5
775	Seq. ID No. 1627	Seq. ID No. 1628	Non-secretory protein	IM	7
779	Seq. ID No. 1633	Seq. ID No. 1634	Signal peptide	Peri	2
788a	Seq. ID No. 1645	Seq. ID No. 1646	Signal peptide	IM	4
788b	Seq. ID No. 1647	Seq. ID No. 1648	Signal peptide	IM	6
789a	Seq. ID No. 1649	Seq. ID No. 1650	Signal peptide	IM	4
791	Seq. ID No. 1655	Seq. ID No. 1656	Non-secretory protein	Cyto	
794d	Seq. ID No. 1665	Seq. ID No. 1666	Signal peptide	OM	0
795	Seq. ID No. 1667	Seq. ID No. 1668	Non-secretory protein	Cyto	
799a	Seq. ID No. 1671	Seq. ID No. 1672	Signal peptide	IM	2
799d	Seq. ID No. 1677	Seq. ID No. 1678	Signal peptide	IM	9
799e	Seq. ID No. 1679	Seq. ID No. 1680	Signal peptide	IM	10
799f	Seq. ID No. 1681	Seq. ID No. 1682	Signal peptide	IM	10
809b	Seq. ID No. 1695	Seq. ID No. 1696	Non-secretory protein	IM	4
820a	Seq. ID No. 1703	Seq. ID No. 1704	Non-secretory protein	IM	0
820b	Seq. ID No. 1705	Seq. ID No. 1706	Non-secretory protein	IM	0
837a	Seq. ID No. 1731	Seq. ID No. 1732	Signal peptide	IM	2
853a	Seq. ID No. 1753	Seq. ID No. 1754	Signal peptide	IM	3
854	Seq. ID No. 1759	Seq. ID No. 1760	Non-secretory protein	IM	2
857	Seq. ID No. 1763	Seq. ID No. 1764	Non-secretory protein	Peri	1
868a	Seq. ID No. 1787	Seq. ID No. 1788	Signal peptide	IM	3

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
873c	Seq. ID No. 1797	Seq. ID No. 1798	Signal peptide	OM	1
886	Seq. ID No. 1821	Seq. ID No. 1822	Signal peptide	OM	1
887	Seq. ID No. 1823	Seq. ID No. 1824	Signal peptide	IM	1
904	Seq. ID No. 1833	Seq. ID No. 1834	Non-secretory protein	Peri	
908a	Seq. ID No. 1839	Seq. ID No. 1840	Signal peptide	IM	6
908b	Seq. ID No. 1841	Seq. ID No. 1842	Non-secretory protein	IM	9
908c	Seq. ID No. 1843	Seq. ID No. 1844	Non-secretory protein	IM	9
939b	Seq. ID No. 1893	Seq. ID No. 1894	Signal peptide	IM	10
951a	Seq. ID No. 1917	Seq. ID No. 1918	Signal peptide	OM	0
951b	Seq. ID No. 1919	Seq. ID No. 1920	Signal peptide	IM	0
977b	Seq. ID No. 1971	Seq. ID No. 1972	Non-secretory protein	Cyto	1
987	Seq. ID No. 1991	Seq. ID No. 1992	Signal peptide	IM	5
998a	Seq. ID No. 2013	Seq. ID No. 2014	Signal peptide	IM	5
998b	Seq. ID No. 2015	Seq. ID No. 2016	Non-secretory protein	IM	5
999a	Seq. ID No. 2017	Seq. ID No. 2018	Signal peptide	IM	2
999b	Seq. ID No. 2019	Seq. ID No. 2020	Signal peptide	IM	2
1006a	Seq. ID No. 2033	Seq. ID No. 2034	Signal peptide	Peri	1
1006b	Seq. ID No. 2035	Seq. ID No. 2036	Signal peptide	Cyto	1
1017a	Seq. ID No. 2049	Seq. ID No. 2050	Signal peptide	IM	4
1035a	Seq. ID No. 2081	Seq. ID No. 2082	Non-secretory protein	IM	1
1035b	Seq. ID No. 2083	Seq. ID No. 2084	Non-secretory protein	IM	1
1035c	Seq. ID No. 2085	Seq. ID No. 2086	Non-secretory protein	IM	1
1044d	Seq. ID No. 2111	Seq. ID No. 2112	Non-secretory protein	IM	3
1047a	Seq. ID No. 2113	Seq. ID No. 2114	Signal peptide	OM	1
1050b	Seq. ID No. 2123	Seq. ID No. 2124	Signal peptide	IM	7
1050c	Seq. ID No. 2125	Seq. ID No. 2126	Signal peptide	IM	7
1050d	Seq. ID No. 2127	Seq. ID No. 2128	Signal peptide	IM	7
1056a	Seq. ID No. 2131	Seq. ID No. 2132	Non-secretory protein	Cyto	
1056b	Seq. ID No. 2133	Seq. ID No. 2134	Non-secretory protein	Cyto	

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
1065c	Seq. ID No. 2153	Seq. ID No. 2154	Non-secretory protein	IM	1
1069	Seq. ID No. 2161	Seq. ID No. 2162	Non-secretory protein	IM	1
1077a	Seq. ID No. 2171	Seq. ID No. 2172	Signal peptide	IM	3
1077c	Seq. ID No. 2175	Seq. ID No. 2176	Non-secretory protein	IM	12
1077e	Seq. ID No. 2179	Seq. ID No. 2180	Non-secretory protein	IM	15
1081a	Seq. ID No. 2187	Seq. ID No. 2188	Signal peptide	Peri	1
1091a	Seq. ID No. 2201	Seq. ID No. 2202	Non-secretory protein	Cyto	
1091b	Seq. ID No. 2203	Seq. ID No. 2204	Non-secretory protein	Peri	
1098b	Seq. ID No. 2221	Seq. ID No. 2222	Non-secretory protein	IM	2
1111a	Seq. ID No. 2237	Seq. ID No. 2238	Signal peptide	IM	6
1126b	Seq. ID No. 2249	Seq. ID No. 2250	Signal peptide	IM	4
1126c	Seq. ID No. 2251	Seq. ID No. 2252	Signal peptide	IM	4
1128	Seq. ID No. 2255	Seq. ID No. 2256	Signal peptide	IM	2
1135a	Seq. ID No. 2261	Seq. ID No. 2262	Non-secretory protein	IM	1
1135b	Seq. ID No. 2263	Seq. ID No. 2264	Non-secretory protein	IM	1
1140a	Seq. ID No. 2271	Seq. ID No. 2272	Signal peptide	IM	2
1141b	Seq. ID No. 2279	Seq. ID No. 2280	Non-secretory protein	Cyto	1
1144a	Seq. ID No. 2283	Seq. ID No. 2284	Signal peptide	IM	2
1144b	Seq. ID No. 2285	Seq. ID No. 2286	Non-secretory protein	IM	4
1146a	Seq. ID No. 2289	Seq. ID No. 2290	Signal peptide	IM	3
1146d	Seq. ID No. 2295	Seq. ID No. 2296	Signal peptide	IM	8
1152b	Seq. ID No. 2305	Seq. ID No. 2306	Signal peptide	IM	5
1152c	Seq. ID No. 2307	Seq. ID No. 2308	Signal peptide	IM	6
1155a	Seq. ID No. 2317	Seq. ID No. 2318	Signal peptide	IM	3
1155b	Seq. ID No. 2319	Seq. ID No. 2320	Signal peptide	IM	4
1155d	Seq. ID No. 2323	Seq. ID No. 2324	Signal peptide	IM	6
1155e	Seq. ID No. 2325	Seq. ID No. 2326	Signal peptide	IM	9
1165	Seq. ID No. 2343	Seq. ID No. 2344	Signal peptide	OM	1
1167b	Seq. ID No. 2349	Seq. ID No. 2350	Signal peptide	IM	2

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
1180b	Seq. ID No. 2385	Seq. ID No. 2386	Non-secretory protein	IM	2
1182a	Seq. ID No. 2393	Seq. ID No. 2394	Signal peptide	IM	1
1194	Seq. ID No. 2423	Seq. ID No. 2424	Non-secretory protein	IM	1
1209	Seq. ID No. 2453	Seq. ID No. 2454	Non-secretory protein	IM	4
1224c	Seq. ID No. 2491	Seq. ID No. 2492	Signal peptide	IM	6
1228a	Seq. ID No. 2497	Seq. ID No. 2498	Signal peptide	IM	1
1228b	Seq. ID No. 2499	Seq. ID No. 2500	Signal peptide	IM	2
1231	Seq. ID No. 2507	Seq. ID No. 2508	Signal peptide	OM	1
1234a	Seq. ID No. 2515	Seq. ID No. 2516	Signal peptide	IM	4
1234b	Seq. ID No. 2517	Seq. ID No. 2518	Signal peptide	IM	4
1235	Seq. ID No. 2521	Seq. ID No. 2522	Non-secretory protein	Cyto	1
1236a	Seq. ID No. 2523	Seq. ID No. 2524	Signal peptide	IM	2
1239	Seq. ID No. 2527	Seq. ID No. 2528	Signal peptide	OM	1
1241b	Seq. ID No. 2533	Seq. ID No. 2534	Signal peptide	IM	7
1241c	Seq. ID No. 2535	Seq. ID No. 2536	Signal peptide	IM	7
1245a	Seq. ID No. 2541	Seq. ID No. 2542	Signal peptide	IM	6
1245b	Seq. ID No. 2543	Seq. ID No. 2544	Signal peptide	IM	10
1245d	Seq. ID No. 2547	Seq. ID No. 2548	Non-secretory protein	IM	12
1245e	Seq. ID No. 2549	Seq. ID No. 2550	Non-secretory protein	IM	12
1250b	Seq. ID No. 2557	Seq. ID No. 2558	Signal peptide	IM	8
1253c	Seq. ID No. 2573	Seq. ID No. 2574	Non-secretory protein	IM	7
1258a	Seq. ID No. 2583	Seq. ID No. 2584	Signal peptide	IM	5
1267a	Seq. ID No. 2601	Seq. ID No. 2602	Signal peptide	IM	2
1267b	Seq. ID No. 2603	Seq. ID No. 2604	Non-secretory protein	IM	3
1275a	Seq. ID No. 2621	Seq. ID No. 2622	Signal peptide	Cyto	1
1289	Seq. ID No. 2653	Seq. ID No. 2654	Non-secretory protein	IM	1
1308b	Seq. ID No. 2681	Seq. ID No. 2682	Signal peptide	IM	4
1314b	Seq. ID No. 2691	Seq. ID No. 2692	Signal peptide	IM	1
1319a	Seq. ID No. 2701	Seq. ID No. 2702	Signal peptide	IM	4



TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
1335a	Seq. ID No. 2733	Seq. ID No. 2734	Signal peptide	OM	2
1338	Seq. ID No. 2739	Seq. ID No. 2740	Non-secretory protein	IM	1
1375	Seq. ID No. 2801	Seq. ID No. 2802	Signal peptide	Cyto	0
1379	Seq. ID No. 2807	Seq. ID No. 2808	Non-secretory protein	IM	1
1382	Seq. ID No. 2815	Seq. ID No. 2816	Signal peptide	OM	1
1384a	Seq. ID No. 2819	Seq. ID No. 2820	Signal peptide	IM	2
1384b	Seq. ID No. 2821	Seq. ID No. 2822	Signal peptide	IM	2
1384c	Seq. ID No. 2823	Seq. ID No. 2824	Signal peptide	IM	2
1389a	Seq. ID No. 2833	Seq. ID No. 2834	Signal peptide	Cyto	0
1393b	Seq. ID No. 2837	Seq. ID No. 2838	Signal peptide	IM	2
1393c	Seq. ID No. 2839	Seq. ID No. 2840	Signal peptide	IM	3
1395a	Seq. ID No. 2845	Seq. ID No. 2846	Signal peptide	Cyto	
1399a	Seq. ID No. 2853	Seq. ID No. 2854	Signal peptide	IM	2
1402c	Seq. ID No. 2861	Seq. ID No. 2862	Signal peptide	IM	2
1407b	Seq. ID No. 2865	Seq. ID No. 2866	Non-secretory protein	IM	1
1411a	Seq. ID No. 2873	Seq. ID No. 2874	Signal peptide	IM	3
1411b	Seq. ID No. 2875	Seq. ID No. 2876	Non-secretory protein	IM	4
1411c	Seq. ID No. 2877	Seq. ID No. 2878	Non-secretory protein	IM	6
1414a	Seq. ID No. 2883	Seq. ID No. 2884	Non-secretory protein	IM	0
1419	Seq. ID No. 2895	Seq. ID No. 2896	Non-secretory protein	IM	
1426a	Seq. ID No. 2905	Seq. ID No. 2906	Signal peptide	IM	4
1439b	Seq. ID No. 2939	Seq. ID No. 2940	Signal peptide	IM	5
1439c	Seq. ID No. 2941	Seq. ID No. 2942	Signal peptide	IM	6
1440a	Seq. ID No. 2947	Seq. ID No. 2948	Signal peptide	IM	6
1452a	Seq. ID No. 2981	Seq. ID No. 2982	Signal peptide	IM	4
1452b	Seq. ID No. 2983	Seq. ID No. 2984	Signal peptide	IM	4
1454	Seq. ID No. 2987	Seq. ID No. 2988	Signal peptide	Cyto	1
1455b	Seq. ID No. 2991	Seq. ID No. 2992	Signal peptide	OM	1
1457a	Seq. ID No. 2995	Seq. ID No. 2996	Signal peptide	IM	3

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
1459	Seq. ID No. 3001	Seq. ID No. 3002	Non-secretory protein	IM	1
1462b	Seq. ID No. 3005	Seq. ID No. 3006	Signal peptide	IM	6
1467	Seq. ID No. 3021	Seq. ID No. 3022	Non-secretory protein	Cyto	2
1469b	Seq. ID No. 3025	Seq. ID No. 3026	Signal peptide	IM	5
1475	Seq. ID No. 3043	Seq. ID No. 3044	Signal peptide	OM	1
1476	Seq. ID No. 3045	Seq. ID No. 3046	Non-secretory protein	IM	5
1488a	Seq. ID No. 3073	Seq. ID No. 3074	Signal peptide	IM	1
1488b	Seq. ID No. 3075	Seq. ID No. 3076	Signal peptide	IM	2
1520	Seq. ID No. 3155	Seq. ID No. 3156	Signal peptide	Peri	1
1530a	Seq. ID No. 3163	Seq. ID No. 3164	Signal peptide	OM	1
1530b	Seq. ID No. 3165	Seq. ID No. 3166	Signal peptide	IM	1
1533a	Seq. ID No. 3167	Seq. ID No. 3168	Non-secretory protein	IM	0
1543	Seq. ID No. 3183	Seq. ID No. 3184	Signal peptide	OM	1
1557a	Seq. ID No. 3213	Seq. ID No. 3214	Signal peptide	IM	4
1557b	Seq. ID No. 3215	Seq. ID No. 3216	Signal peptide	IM	5
1569	Seq. ID No. 3235	Seq. ID No. 3236	Non-secretory protein	IM	2
1572c	Seq. ID No. 3245	Seq. ID No. 3246	Signal peptide	IM	10
1580a	Seq. ID No. 3261	Seq. ID No. 3262	Signal peptide	IM	1
1580b	Seq. ID No. 3263	Seq. ID No. 3264	Signal peptide	IM	1
1581	Seq. ID No. 3265	Seq. ID No. 3266	Non-secretory protein	IM	1
1582b	Seq. ID No. 3269	Seq. ID No. 3270	Signal peptide	IM	1
1582c	Seq. ID No. 3271	Seq. ID No. 3272	Non-secretory protein	IM	1
1585a	Seq. ID No. 3275	Seq. ID No. 3276	Signal peptide	IM	1
1585b	Seq. ID No. 3277	Seq. ID No. 3278	Signal peptide	IM	1
1606a	Seq. ID No. 3317	Seq. ID No. 3318	Signal peptide	IM	1
1608	Seq. ID No. 3325	Seq. ID No. 3326	Signal peptide	Cyto	1
1619	Seq. ID No. 3337	Seq. ID No. 3338	Signal peptide	OM	1
1625a	Seq. ID No. 3351	Seq. ID No. 3352	Signal peptide	IM	4
1646a	Seq. ID No. 3389	Seq. ID No. 3390	Signal peptide	IM	2

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
1649a	Seq. ID No. 3405	Seq. ID No. 3406	Signal peptide	Peri	2
1657	Seq. ID No. 3419	Seq. ID No. 3420	Non-secretory protein	Cyto	
1659a	Seq. ID No. 3421	Seq. ID No. 3422	Signal peptide	OM	1
1659b	Seq. ID No. 3423	Seq. ID No. 3424	Non-secretory protein	IM	9
1673b	Seq. ID No. 3451	Seq. ID No. 3452	Signal peptide	IM	8
1673c	Seq. ID No. 3453	Seq. ID No. 3454	Signal peptide	IM	10
1673d	Seq. ID No. 3455	Seq. ID No. 3456	Signal peptide	IM	12
1688a	Seq. ID No. 3491	Seq. ID No. 3492	Signal peptide	IM	3
1688c	Seq. ID No. 3495	Seq. ID No. 3496	Non-secretory protein	IM	11
1690a	Seq. ID No. 3503	Seq. ID No. 3504	Signal peptide	IM	1
1690b	Seq. ID No. 3505	Seq. ID No. 3506	Signal peptide	IM	2
1694c	Seq. ID No. 3517	Seq. ID No. 3518	Signal peptide	IM	1
1694d	Seq. ID No. 3519	Seq. ID No. 3520	Signal peptide	IM	1
1705a	Seq. ID No. 3545	Seq. ID No. 3546	Non-secretory protein	Cyto	
1705b	Seq. ID No. 3547	Seq. ID No. 3548	Non-secretory protein	Cyto	
1718a	Seq. ID No. 3571	Seq. ID No. 3572	Non-secretory protein	Cyto	
1735a	Seq. ID No. 3593	Seq. ID No. 3594	Signal peptide	OM	1
1745	Seq. ID No. 3617	Seq. ID No. 3618	Signal peptide	Peri	0
1749a	Seq. ID No. 3621	Seq. ID No. 3622	Signal peptide	IM	3
1752b	Seq. ID No. 3629	Seq. ID No. 3630	Signal peptide	Peri	1
1769b	Seq. ID No. 3663	Seq. ID No. 3664	Non-secretory protein	IM	7
1790a	Seq. ID No. 3701	Seq. ID No. 3702	Non-secretory protein	Cyto	2
1790b	Seq. ID No. 3703	Seq. ID No. 3704	Non-secretory protein	Cyto	3
1798a	Seq. ID No. 3723	Seq. ID No. 3724	Signal peptide	IM	2
1804a	Seq. ID No. 3737	Seq. ID No. 3738	Non-secretory protein	IM	2
1805	Seq. ID No. 3741	Seq. ID No. 3742	Signal peptide	IM	3
1806b	Seq. ID No. 3745	Seq. ID No. 3746	Signal peptide	IM	5
1806c	Seq. ID No. 3747	Seq. ID No. 3748	Non-secretory protein	IM	5
1808d	Seq. ID No. 3759	Seq. ID No. 3760	Non-secretory protein	IM	15

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
1809b	Seq. ID No. 3763	Seq. ID No. 3764	Signal peptide	IM	7
1809d	Seq. ID No. 3767	Seq. ID No. 3768	Non-secretory protein	IM	12
1809e	Seq. ID No. 3769	Seq. ID No. 3770	Non-secretory protein	IM	14
1809f	Seq. ID No. 3771	Seq. ID No. 3772	Non-secretory protein	IM	14
1813	Seq. ID No. 3785	Seq. ID No. 3786	Non-secretory protein	IM	1
1816a	Seq. ID No. 3793	Seq. ID No. 3794	Signal peptide	Peri	1
1825	Seq. ID No. 3813	Seq. ID No. 3814	Signal peptide	IM	2
1838a	Seq. ID No. 3837	Seq. ID No. 3838	Signal peptide	IM	3
1838b	Seq. ID No. 3839	Seq. ID No. 3840	Signal peptide	IM	4
1845b	Seq. ID No. 3861	Seq. ID No. 3862	Signal peptide	IM	8
1848a	Seq. ID No. 3865	Seq. ID No. 3866	Signal peptide	IM	7
1857b	Seq. ID No. 3889	Seq. ID No. 3890	Signal peptide	IM	5
1857c	Seq. ID No. 3891	Seq. ID No. 3892	Signal peptide	IM	6
1858	Seq. ID No. 3895	Seq. ID No. 3896	Signal peptide	Cyto	0
1868	Seq. ID No. 3915	Seq. ID No. 3916	Signal peptide	IM	1
1873b	Seq. ID No. 3923	Seq. ID No. 3924	Signal peptide	Peri	1
1873c	Seq. ID No. 3925	Seq. ID No. 3926	Signal peptide	Peri	1
1875c	Seq. ID No. 3929	Seq. ID No. 3930	Non-secretory protein	IM	1
1896b	Seq. ID No. 3965	Seq. ID No. 3966	Non-secretory protein	IM	2
1898b	Seq. ID No. 3975	Seq. ID No. 3976	Signal peptide	IM	4
1900	Seq. ID No. 3979	Seq. ID No. 3980	Non-secretory protein	Cyto	1
1917a	Seq. ID No. 3995	Seq. ID No. 3996	Signal peptide	IM	0
1917b	Seq. ID No. 3997	Seq. ID No. 3998	Signal peptide	IM	0
1919c	Seq. ID No. 4009	Seq. ID No. 4010	Signal peptide	IM	1
1936	Seq. ID No. 4039	Seq. ID No. 4040	Signal peptide	IM	6
1937a	Seq. ID No. 4041	Seq. ID No. 4042	Signal peptide	IM	2
1941b	Seq. ID No. 4061	Seq. ID No. 4062	Signal peptide	IM	4
1950	Seq. ID No. 4079	Seq. ID No. 4080	Signal peptide	OM	1
1951a	Seq. ID No. 4081	Seq. ID No. 4082	Signal peptide	IM	3

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
1960c	Seq. ID No. 4111	Seq. ID No. 4112	Signal peptide	IM	1
1961	Seq. ID No. 4113	Seq. ID No. 4114	Non-secretory protein	IM	1
1972	Seq. ID No. 4135	Seq. ID No. 4136	Signal peptide	Cyto	1
1976	Seq. ID No. 4139	Seq. ID No. 4140	Signal peptide	IM	1
1981	Seq. ID No. 4155	Seq. ID No. 4156	Non-secretory protein	Cyto	1
1991	Seq. ID No. 4181	Seq. ID No. 4182	Signal peptide	Cyto	1
2008	Seq. ID No. 4203	Seq. ID No. 4204	Non-secretory protein	IM	2
2016a	Seq. ID No. 4221	Seq. ID No. 4222	Signal peptide	IM	2
2024b	Seq. ID No. 4247	Seq. ID No. 4248	Signal peptide	IM	2
2025	Seq. ID No. 4253	Seq. ID No. 4254	Signal peptide	OM	1
2030a	Seq. ID No. 4257	Seq. ID No. 4258	Signal peptide	IM	4
2030b	Seq. ID No. 4259	Seq. ID No. 4260	Signal peptide	IM	5
2030c	Seq. ID No. 4261	Seq. ID No. 4262	Signal peptide	IM	5
2030d	Seq. ID No. 4263	Seq. ID No. 4264	Signal peptide	IM	5
2035b	Seq. ID No. 4269	Seq. ID No. 4270	Signal peptide	Cyto	0
2059a	Seq. ID No. 4311	Seq. ID No. 4312	Signal peptide	IM	2
2092	Seq. ID No. 4379	Seq. ID No. 4380	Signal peptide	IM	2
2096c	Seq. ID No. 4389	Seq. ID No. 4390	Signal peptide	IM	10
2096d	Seq. ID No. 4391	Seq. ID No. 4392	Signal peptide	IM	10
2140b	Seq. ID No. 4471	Seq. ID No. 4472	Non-secretory protein	IM	5
2142a	Seq. ID No. 4473	Seq. ID No. 4474	Signal peptide	IM	1
2146	Seq. ID No. 4481	Seq. ID No. 4482	Signal peptide	OM	1
2161a	Seq. ID No. 4525	Seq. ID No. 4526	Non-secretory protein	Cyto	1
2175	Seq. ID No. 4551	Seq. ID No. 4552	Non-secretory protein	IM	2
2177b	Seq. ID No. 4561	Seq. ID No. 4562	Non-secretory protein	IM	1
2182	Seq. ID No. 4573	Seq. ID No. 4574	Non-secretory protein	IM	1
2208a	Seq. ID No. 4617	Seq. ID No. 4618	Non-secretory protein	Cyto	0
2219a	Seq. ID No. 4639	Seq. ID No. 4640	Signal peptide	IM	1
2225	Seq. ID No. 4659	Seq. ID No. 4660	Signal peptide	OM	0

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
2236a	Seq. ID No. 4681	Seq. ID No. 4682	Signal peptide	IM	2
2246	Seq. ID No. 4701	Seq. ID No. 4702	Non-secretory protein	IM	
2249	Seq. ID No. 4705	Seq. ID No. 4706	Signal peptide	OM	1
2253d	Seq. ID No. 4713	Seq. ID No. 4714	Non-secretory protein	IM	7
2255b	Seq. ID No. 4717	Seq. ID No. 4718	Signal peptide	IM	6
2257	Seq. ID No. 4721	Seq. ID No. 4722	Non-secretory protein	IM	0
2264b	Seq. ID No. 4737	Seq. ID No. 4738	Signal peptide	IM	1
2268	Seq. ID No. 4741	Seq. ID No. 4742	Non-secretory protein	Cyto	0
2300	Seq. ID No. 4813	Seq. ID No. 4814	Signal peptide	IM	4
2302	Seq. ID No. 4817	Seq. ID No. 4818	Non-secretory protein	IM	1
2303	Seq. ID No. 4819	Seq. ID No. 4820	Non-secretory protein	IM	1
2309a	Seq. ID No. 4829	Seq. ID No. 4830	Non-secretory protein	IM	2
2309b	Seq. ID No. 4831	Seq. ID No. 4832	Non-secretory protein	IM	2
2317	Seq. ID No. 4851	Seq. ID No. 4852	Non-secretory protein	IM	2
2329a	Seq. ID No. 4869	Seq. ID No. 4870	Signal peptide	IM	1
2329d	Seq. ID No. 4875	Seq. ID No. 4876	Signal peptide	IM	7
2350a	Seq. ID No. 4913	Seq. ID No. 4914	Non-secretory protein	Cyto	
2357	Seq. ID No. 4919	Seq. ID No. 4920	Signal peptide	IM	2
2363a	Seq. ID No. 4929	Seq. ID No. 4930	Signal peptide	IM	1
2363b	Seq. ID No. 4931	Seq. ID No. 4932	Signal peptide	IM	1
2386c	Seq. ID No. 4983	Seq. ID No. 4984	Non-secretory protein	IM	0
2394	Seq. ID No. 4993	Seq. ID No. 4994	Non-secretory protein	IM	1
2402a	Seq. ID No. 5011	Seq. ID No. 5012	Non-secretory protein	IM	1
2407a	Seq. ID No. 5023	Seq. ID No. 5024	Non-secretory protein	IM	0
2412	Seq. ID No. 5031	Seq. ID No. 5032	Signal peptide	IM	2
2413a	Seq. ID No. 5033	Seq. ID No. 5034	Non-secretory protein	Cyto	0
2413b	Seq. ID No. 5035	Seq. ID No. 5036	Non-secretory protein	Peri	0
2416c	Seq. ID No. 5043	Seq. ID No. 5044	Non-secretory protein	IM	1
2423a	Seq. ID No. 5061	Seq. ID No. 5062	Signal peptide	IM	5

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
2423b	Seq. ID No. 5063	Seq. ID No. 5064	Signal peptide	IM	5
2424c	Seq. ID No. 5069	Seq. ID No. 5070	Signal peptide	IM	1
2445	Seq. ID No. 5103	Seq. ID No. 5104	Signal peptide	IM	1
2456b	Seq. ID No. 5121	Seq. ID No. 5122	Non-secretory protein	IM	5
2456c	Seq. ID No. 5123	Seq. ID No. 5124	Signal peptide	IM	8
2458b	Seq. ID No. 5131	Seq. ID No. 5132	Signal peptide	IM	6
2458c	Seq. ID No. 5133	Seq. ID No. 5134	Signal peptide	IM	7
2458d	Seq. ID No. 5135	Seq. ID No. 5136	Signal peptide	IM	7
2458e	Seq. ID No. 5137	Seq. ID No. 5138	Signal peptide	IM	8
2458f	Seq. ID No. 5139	Seq. ID No. 5140	Signal peptide	IM	9
2458g	Seq. ID No. 5141	Seq. ID No. 5142	Signal peptide	IM	9
2463a	Seq. ID No. 5151	Seq. ID No. 5152	Non-secretory protein	IM	1
2468a	Seq. ID No. 5159	Seq. ID No. 5160	Signal peptide	IM	1
2468b	Seq. ID No. 5161	Seq. ID No. 5162	Non-secretory protein	IM	1
2469b	Seq. ID No. 5165	Seq. ID No. 5166	Signal peptide	IM	2
2470	Seq. ID No. 5167	Seq. ID No. 5168	Non-secretory protein	Cyto	0
2474b	Seq. ID No. 5175	Seq. ID No. 5176	Signal peptide	IM	3
2474c	Seq. ID No. 5177	Seq. ID No. 5178	Non-secretory protein	IM	3
2490	Seq. ID No. 5205	Seq. ID No. 5206	Signal peptide	IM	1
2492a	Seq. ID No. 5207	Seq. ID No. 5208	Signal peptide	IM	1
2494	Seq. ID No. 5211	Seq. ID No. 5212	Non-secretory protein	IM	0
2495b	Seq. ID No. 5215	Seq. ID No. 5216	Non-secretory protein	IM	10
2497b	Seq. ID No. 5219	Seq. ID No. 5220	Signal peptide	Peri	2
2500a	Seq. ID No. 5223	Seq. ID No. 5224	Signal peptide	OM	1
2525a	Seq. ID No. 5285	Seq. ID No. 5286	Signal peptide	IM	1
2525b	Seq. ID No. 5287	Seq. ID No. 5288	Non-secretory protein	IM	1
2547b	Seq. ID No. 5329	Seq. ID No. 5330	Signal peptide	IM	1
2547c	Seq. ID No. 5331	Seq. ID No. 5332	Signal peptide	IM	1
2564b	Seq. ID No. 5377	Seq. ID No. 5378	Signal peptide	OM	1

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
2564c	Seq. ID No. 5379	Seq. ID No. 5380	Signal peptide	OM	1
2564d	Seq. ID No. 5381	Seq. ID No. 5382	Non-secretory protein	IM	1
2567a	Seq. ID No. 5385	Seq. ID No. 5386	Signal peptide	IM	4
2582a	Seq. ID No. 5405	Seq. ID No. 5406	Signal peptide	IM	4
2582b	Seq. ID No. 5407	Seq. ID No. 5408	Non-secretory protein	IM	4
2610	Seq. ID No. 5453	Seq. ID No. 5454	Signal peptide	IM	1
2616a	Seq. ID No. 5459	Seq. ID No. 5460	Signal peptide	IM	2
2616b	Seq. ID No. 5461	Seq. ID No. 5462	Signal peptide	IM	3
2616c	Seq. ID No. 5463	Seq. ID No. 5464	Signal peptide	IM	4
2618b	Seq. ID No. 5481	Seq. ID No. 5482	Non-secretory protein	IM	
2628	Seq. ID No. 5509	Seq. ID No. 5510	Signal peptide	IM	1
2637a	Seq. ID No. 5529	Seq. ID No. 5530	Signal peptide	OM	1
2637b	Seq. ID No. 5531	Seq. ID No. 5532	Signal peptide	IM	1
2655b	Seq. ID No. 5557	Seq. ID No. 5558	Non-secretory protein	IM	1
2660	Seq. ID No. 5569	Seq. ID No. 5570	Signal peptide	Peri	1
2665	Seq. ID No. 5577	Seq. ID No. 5578	Non-secretory protein	IM	1
2683a	Seq. ID No. 5623	Seq. ID No. 5624	Signal peptide	IM	1
2683b	Seq. ID No. 5625	Seq. ID No. 5626	Signal peptide	IM	1
2690a	Seq. ID No. 5643	Seq. ID No. 5644	Signal peptide	Peri	1
2696a	Seq. ID No. 5659	Seq. ID No. 5660	Signal peptide	IM	8
2696b	Seq. ID No. 5661	Seq. ID No. 5662	Non-secretory protein	IM	8
2718b	Seq. ID No. 5683	Seq. ID No. 5684	Signal peptide	IM	3
2718c	Seq. ID No. 5685	Seq. ID No. 5686	Signal peptide	IM	4
2728a	Seq. ID No. 5709	Seq. ID No. 5710	Signal peptide	IM	1
2728b	Seq. ID No. 5711	Seq. ID No. 5712	Signal peptide	IM	1
2738c	Seq. ID No. 5733	Seq. ID No. 5734	Signal peptide	IM	12
2742b	Seq. ID No. 5739	Seq. ID No. 5740	Signal peptide	Peri	
2749b	Seq. ID No. 5765	Seq. ID No. 5766	Signal peptide	IM	4
2760a	Seq. ID No. 5797	Seq. ID No. 5798	Signal peptide	Peri	1



TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
2769a	Seq. ID No. 5827	Seq. ID No. 5828	Non-secretory protein	IM	0
2799a	Seq. ID No. 5889	Seq. ID No. 5890	Signal peptide	OM	1
2801a	Seq. ID No. 5893	Seq. ID No. 5894	Signal peptide	IM	1
2810a	Seq. ID No. 5905	Seq. ID No. 5906	Signal peptide	IM	3
2810c	Seq. ID No. 5909	Seq. ID No. 5910	Signal peptide	IM	4
2810d	Seq. ID No. 5911	Seq. ID No. 5912	Non-secretory protein	IM	4
2818b	Seq. ID No. 5923	Seq. ID No. 5924	Signal peptide	IM	5
2837a	Seq. ID No. 5963	Seq. ID No. 5964	Non-secretory protein	IM	2
2837b	Seq. ID No. 5965	Seq. ID No. 5966	Non-secretory protein	IM	3
2869b	Seq. ID No. 6025	Seq. ID No. 6026	Signal peptide	OM	1
2869c	Seq. ID No. 6027	Seq. ID No. 6028	Signal peptide	IM	1
2872	Seq. ID No. 6031	Seq. ID No. 6032	Non-secretory protein	Cyto	
2881	Seq. ID No. 6043	Seq. ID No. 6044	Signal peptide	IM	1
2882	Seq. ID No. 6045	Seq. ID No. 6046	Non-secretory protein	IM	2
2883a	Seq. ID No. 6047	Seq. ID No. 6048	Signal peptide	IM	6
2883d	Seq. ID No. 6053	Seq. ID No. 6054	Signal peptide	IM	8
2887a	Seq. ID No. 6059	Seq. ID No. 6060	Signal peptide	Peri	1
2909c	Seq. ID No. 6109	Seq. ID No. 6110	Signal peptide	IM	4
2909d	Seq. ID No. 6111	Seq. ID No. 6112	Signal peptide	IM	4
2913a	Seq. ID No. 6115	Seq. ID No. 6116	Signal peptide	IM	2
2913b	Seq. ID No. 6117	Seq. ID No. 6118	Signal peptide	IM	2
2917	Seq. ID No. 6127	Seq. ID No. 6128	Non-secretory protein	OM	1
2920	Seq. ID No. 6131	Seq. ID No. 6132	Non-secretory protein	IM	2
2922b	Seq. ID No. 6135	Seq. ID No. 6136	Signal peptide	Cyto	0
2923a	Seq. ID No. 6137	Seq. ID No. 6138	Signal peptide	Cyto	
2931a	Seq. ID No. 6161	Seq. ID No. 6162	Signal peptide	IM	5
2931c	Seq. ID No. 6165	Seq. ID No. 6166	Signal peptide	IM	13
2941a	Seq. ID No. 6183	Seq. ID No. 6184	Signal peptide	IM	2
2943a	Seq. ID No. 6189	Seq. ID No. 6190	Signal peptide	IM	3

TABLE 4: SIGNALP: YES

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	HMMSignalP	PSORT	MSD
2943b	Seq. ID No. 6191	Seq. ID No. 6192	Signal peptide	IM	5
2943c	Seq. ID No. 6193	Seq. ID No. 6194	Non-secretory protein	IM	6
2948c	Seq. ID No. 6207	Seq. ID No. 6208	Non-secretory protein	IM	6
2948d	Seq. ID No. 6209	Seq. ID No. 6210	Signal peptide	IM	7
2952	Seq. ID No. 6217	Seq. ID No. 6218	Signal peptide	Cyto	1
2955c	Seq. ID No. 6225	Seq. ID No. 6226	Signal peptide	IM	6
2957	Seq. ID No. 6235	Seq. ID No. 6236	Signal peptide	IM	4
2959	Seq. ID No. 6243	Seq. ID No. 6244	Signal peptide	IM	2
2962b	Seq. ID No. 6249	Seq. ID No. 6250	Signal peptide	IM	1
2965a	Seq. ID No. 6253	Seq. ID No. 6254	Signal peptide	Cyto	1
2966	Seq. ID No. 6259	Seq. ID No. 6260	Signal peptide	IM	1
2970a	Seq. ID No. 6265	Seq. ID No. 6266	Signal peptide	IM	1
2970b	Seq. ID No. 6267	Seq. ID No. 6268	Signal peptide	IM	1
2974b	Seq. ID No. 6275	Seq. ID No. 6276	Signal peptide	IM	4
2978a	Seq. ID No. 6283	Seq. ID No. 6284	Signal peptide	Peri	1
2978b	Seq. ID No. 6285	Seq. ID No. 6286	Signal peptide	Peri	1
2986b	Seq. ID No. 6303	Seq. ID No. 6304	Signal peptide	IM	7
2993a	Seq. ID No. 6325	Seq. ID No. 6326	Signal peptide	OM	0
2993b	Seq. ID No. 6327	Seq. ID No. 6328	Signal peptide	OM	0
3016a	Seq. ID No. 6363	Seq. ID No. 6364	Signal peptide	IM	4
3016b	Seq. ID No. 6365	Seq. ID No. 6366	Signal peptide	IM	7
3016c	Seq. ID No. 6367	Seq. ID No. 6368	Non-secretory protein	IM	7
3024b	Seq. ID No. 6385	Seq. ID No. 6386	Non-secretory protein	Cyto	1
3042a	Seq. ID No. 6425	Seq. ID No. 6426	Signal peptide	Cyto	1
3042b	Seq. ID No. 6427	Seq. ID No. 6428	Signal peptide	Cyto	1
3043a	Seq. ID No. 6429	Seq. ID No. 6430	Signal peptide	IM	2
3043b	Seq. ID No. 6431	Seq. ID No. 6432	Signal peptide	IM	2
3054	Seq. ID No. 6453	Seq. ID No. 6454	Non-secretory protein	Cyto	
3061	Seq. ID No. 6465	Seq. ID No. 6466	Non-secretory protein	Peri	1

**TABLE 4: SIGNALP: YES**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>HMMSignalP</b>	<b>PSORT</b>	<b>MSD</b>
3063a	Seq. ID No. 6469	Seq. ID No. 6470	Non-secretory protein	Cyto	0
3063b	Seq. ID No. 6471	Seq. ID No. 6472	Non-secretory protein	Cyto	0
3066	Seq. ID No. 6479	Seq. ID No. 6480	Signal peptide	Cyto	0
3095	Seq. ID No. 6539	Seq. ID No. 6540	Non-secretory protein	IM	1
3096a	Seq. ID No. 6541	Seq. ID No. 6542	Signal peptide	IM	1
3107a	Seq. ID No. 6571	Seq. ID No. 6572	Signal peptide	OM	1
3107b	Seq. ID No. 6573	Seq. ID No. 6574	Signal peptide	OM	2
3145c	Seq. ID No. 6639	Seq. ID No. 6640	Signal peptide	OM	1
3147b	Seq. ID No. 6643	Seq. ID No. 6644	Signal peptide	IM	0
3147c	Seq. ID No. 6645	Seq. ID No. 6646	Signal peptide	OM	0

Listed in Table 5 are 936 ORFs that meet the criteria of having a signal peptide based on the HMM SignalP program. Of these ORFs, the PSORT program predicted 71 ORFs to be localized to the periplasm (Peri); 93 ORFs to be localized to the outer membrane (OM); 663 ORFs to be localized to the cytoplasmic inner membrane (IM); and 109 ORFs to be localized to the cytoplasm. Shown for all ORFs is the predicted number of transmembrane domains predicted by the TopPred2 software (listed in the MSD column).

**TABLE 5: SIGNALP: SIGNAL PEPTIDE**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>SignalP</b>	<b>PSORT</b>	<b>MSD</b>
2a	Seq. ID No. 3	Seq. ID No. 4	NO	IM	3
4a	Seq. ID No. 7	Seq. ID No. 8	Yes	IM	4
4b	Seq. ID No. 9	Seq. ID No. 10	Maybe	IM	10
11	Seq. ID No. 19	Seq. ID No. 20	maybe	Cyto	0
13a	Seq. ID No. 21	Seq. ID No. 22	NO	Cyto	0
21b	Seq. ID No. 31	Seq. ID No. 32	maybe	Cyto	1
23a	Seq. ID No. 33	Seq. ID No. 34	maybe	IM	1
38a	Seq. ID No. 45	Seq. ID No. 46	yes	OM	1

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
38b	Seq. ID No. 47	Seq. ID No. 48	yes	OM	1
39a	Seq. ID No. 49	Seq. ID No. 50	maybe	IM	4
40	Seq. ID No. 53	Seq. ID No. 54	yes	IM	1
44a	Seq. ID No. 65	Seq. ID No. 66	yes	IM	2
44b	Seq. ID No. 67	Seq. ID No. 68	yes	IM	2
51a	Seq. ID No. 85	Seq. ID No. 86	maybe	IM	5
51b	Seq. ID No. 87	Seq. ID No. 88	yes	IM	9
61	Seq. ID No. 105	Seq. ID No. 106	NO	Cyto	2
62c	Seq. ID No. 111	Seq. ID No. 112	NO	IM	1
66a	Seq. ID No. 123	Seq. ID No. 124	NO	OM	1
73a	Seq. ID No. 131	Seq. ID No. 132	YES	Cyto	1
73b	Seq. ID No. 133	Seq. ID No. 134	YES	Cyto	1
80a	Seq. ID No. 141	Seq. ID No. 142	maybe	IM	4
86	Seq. ID No. 159	Seq. ID No. 160	yes	Peri	1
87a	Seq. ID No. 161	Seq. ID No. 162	YES	OM	1
87b	Seq. ID No. 163	Seq. ID No. 164	YES	IM	1
91a	Seq. ID No. 171	Seq. ID No. 172	maybe	OM	0
99	Seq. ID No. 191	Seq. ID No. 192	maybe	IM	10
109a	Seq. ID No. 209	Seq. ID No. 210	maybe	IM	5
109b	Seq. ID No. 211	Seq. ID No. 212	yes	IM	7
109c	Seq. ID No. 213	Seq. ID No. 214	YES	IM	8
109d	Seq. ID No. 215	Seq. ID No. 216	YES	IM	8
111a	Seq. ID No. 217	Seq. ID No. 218	yes	IM	6
114	Seq. ID No. 225	Seq. ID No. 226	YES	OM	1
124a	Seq. ID No. 235	Seq. ID No. 236	yes	IM	1
124b	Seq. ID No. 237	Seq. ID No. 238	yes	IM	3
129a	Seq. ID No. 249	Seq. ID No. 250	YES	IM	6
129b	Seq. ID No. 251	Seq. ID No. 252	YES	IM	9
132a	Seq. ID No. 255	Seq. ID No. 256	maybe	IM	2

**TABLE 5: SIGNALP: SIGNAL PEPTIDE**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>SignalP</b>	<b>PSORT</b>	<b>MSD</b>
132b	Seq. ID No. 257	Seq. ID No. 258	maybe	IM	2
132c	Seq. ID No. 259	Seq. ID No. 260	maybe	IM	2
138a	Seq. ID No. 271	Seq. ID No. 272	yes	IM	6
138b	Seq. ID No. 273	Seq. ID No. 274	maybe	IM	6
143	Seq. ID No. 277	Seq. ID No. 278	maybe	IM	2
145a	Seq. ID No. 285	Seq. ID No. 286	yes	IM	3
145b	Seq. ID No. 287	Seq. ID No. 288	YES	IM	10
145c	Seq. ID No. 289	Seq. ID No. 290	YES	IM	12
162a	Seq. ID No. 327	Seq. ID No. 328	yes	IM	2
162b	Seq. ID No. 329	Seq. ID No. 330	maybe	IM	3
173	Seq. ID No. 357	Seq. ID No. 358	maybe	IM	1
174	Seq. ID No. 359	Seq. ID No. 360	maybe	Peri	1
180a	Seq. ID No. 373	Seq. ID No. 374	maybe	IM	2
180b	Seq. ID No. 375	Seq. ID No. 376	YES	IM	10
191b	Seq. ID No. 393	Seq. ID No. 394	maybe	IM	1
194a	Seq. ID No. 401	Seq. ID No. 402	maybe	Cyto	1
194b	Seq. ID No. 403	Seq. ID No. 404	maybe	Cyto	1
223a	Seq. ID No. 455	Seq. ID No. 456	yes	Cyto	1
223b	Seq. ID No. 457	Seq. ID No. 458	yes	Cyto	1
235a	Seq. ID No. 477	Seq. ID No. 478	maybe	Cyto	0
239a	Seq. ID No. 487	Seq. ID No. 488	NO	Cyto	2
239b	Seq. ID No. 489	Seq. ID No. 490	NO	Cyto	2
239c	Seq. ID No. 491	Seq. ID No. 492	NO	Cyto	2
240	Seq. ID No. 493	Seq. ID No. 494	maybe	Cyto	
241	Seq. ID No. 495	Seq. ID No. 496	yes	IM	1
245a	Seq. ID No. 497	Seq. ID No. 498	YES	IM	5
245b	Seq. ID No. 499	Seq. ID No. 500	yes	IM	10
246a	Seq. ID No. 503	Seq. ID No. 504	YES	IM	7
246b	Seq. ID No. 505	Seq. ID No. 506	YES	IM	9

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
248a	Seq. ID No. 509	Seq. ID No. 510	maybe	IM	8
248b	Seq. ID No. 511	Seq. ID No. 512	yes	IM	9
249a	Seq. ID No. 513	Seq. ID No. 514	yes	OM	1
249b	Seq. ID No. 515	Seq. ID No. 516	yes	IM	1
255a	Seq. ID No. 525	Seq. ID No. 526	yes	IM	6
255b	Seq. ID No. 527	Seq. ID No. 528	YES	IM	10
263a	Seq. ID No. 545	Seq. ID No. 546	yes	OM	1
263b	Seq. ID No. 547	Seq. ID No. 548	yes	IM	1
264b	Seq. ID No. 549	Seq. ID No. 550	YES	IM	1
268	Seq. ID No. 557	Seq. ID No. 558	yes	Cyto	1
273a	Seq. ID No. 567	Seq. ID No. 568	maybe	IM	8
273b	Seq. ID No. 569	Seq. ID No. 570	yes	IM	12
277c	Seq. ID No. 575	Seq. ID No. 576	YES	OM	1
279a	Seq. ID No. 577	Seq. ID No. 578	maybe	IM	3
279b	Seq. ID No. 579	Seq. ID No. 580	maybe	IM	5
283a	Seq. ID No. 591	Seq. ID No. 592	yes	OM	1
283b	Seq. ID No. 593	Seq. ID No. 594	yes	OM	1
285b	Seq. ID No. 599	Seq. ID No. 600	maybe	Cyto	
297	Seq. ID No. 617	Seq. ID No. 618	YES	Peri	1
311	Seq. ID No. 637	Seq. ID No. 638	yes	IM	6
313a	Seq. ID No. 639	Seq. ID No. 640	yes	IM	2
313b	Seq. ID No. 641	Seq. ID No. 642	yes	IM	3
313c	Seq. ID No. 643	Seq. ID No. 644	maybe	IM	6
313d	Seq. ID No. 645	Seq. ID No. 646	maybe	IM	6
313e	Seq. ID No. 647	Seq. ID No. 648	maybe	IM	6
317a	Seq. ID No. 653	Seq. ID No. 654	yes	IM	2
317b	Seq. ID No. 655	Seq. ID No. 656	maybe	IM	4
318a	Seq. ID No. 657	Seq. ID No. 658	YES	OM	2
318b	Seq. ID No. 659	Seq. ID No. 660	YES	OM	2

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
318c	Seq. ID No. 661	Seq. ID No. 662	YES	IM	2
320	Seq. ID No. 667	Seq. ID No. 668	maybe	Cyto	1
321	Seq. ID No. 669	Seq. ID No. 670	yes	OM	1
324	Seq. ID No. 675	Seq. ID No. 676	YES	OM	1
327a	Seq. ID No. 677	Seq. ID No. 678	maybe	IM	3
327b	Seq. ID No. 679	Seq. ID No. 680	yes	IM	5
342a	Seq. ID No. 715	Seq. ID No. 716	YES	IM	2
342b	Seq. ID No. 717	Seq. ID No. 718	YES	IM	3
342c	Seq. ID No. 719	Seq. ID No. 720	yes	IM	4
342d	Seq. ID No. 721	Seq. ID No. 722	NO	IM	6
342e	Seq. ID No. 723	Seq. ID No. 724	yes	IM	10
342f	Seq. ID No. 725	Seq. ID No. 726	NO	IM	12
349b	Seq. ID No. 745	Seq. ID No. 746	YES	OM	1
349c	Seq. ID No. 747	Seq. ID No. 748	YES	OM	1
350a	Seq. ID No. 749	Seq. ID No. 750	yes	IM	6
350b	Seq. ID No. 751	Seq. ID No. 752	yes	IM	6
352a	Seq. ID No. 755	Seq. ID No. 756	YES	IM	3
352b	Seq. ID No. 757	Seq. ID No. 758	YES	IM	3
352c	Seq. ID No. 759	Seq. ID No. 760	YES	IM	6
354a	Seq. ID No. 761	Seq. ID No. 762	YES	IM	4
354b	Seq. ID No. 763	Seq. ID No. 764	yes	IM	6
354c	Seq. ID No. 765	Seq. ID No. 766	yes	IM	6
356a	Seq. ID No. 769	Seq. ID No. 770	yes	IM	3
358a	Seq. ID No. 777	Seq. ID No. 778	yes	IM	3
358b	Seq. ID No. 779	Seq. ID No. 780	yes	IM	10
358c	Seq. ID No. 781	Seq. ID No. 782	yes	IM	10
372d	Seq. ID No. 807	Seq. ID No. 808	YES	OM	1
374	Seq. ID No. 809	Seq. ID No. 810	NO	IM	1
382b	Seq. ID No. 819	Seq. ID No. 820	yes	OM	1

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
384a	Seq. ID No. 825	Seq. ID No. 826	maybe	IM	2
403b	Seq. ID No. 863	Seq. ID No. 864	NO	Peri	2
418a	Seq. ID No. 893	Seq. ID No. 894	NO	IM	5
419c	Seq. ID No. 901	Seq. ID No. 902	NO	IM	2
431	Seq. ID No. 935	Seq. ID No. 936	yes	OM	1
434	Seq. ID No. 937	Seq. ID No. 938	yes	IM	2
437b	Seq. ID No. 941	Seq. ID No. 942	maybe	Cyto	1
437c	Seq. ID No. 943	Seq. ID No. 944	maybe	Cyto	1
441b	Seq. ID No. 955	Seq. ID No. 956	yes	IM	2
443b	Seq. ID No. 957	Seq. ID No. 958	maybe	Cyto	
448	Seq. ID No. 967	Seq. ID No. 968	YES	IM	1
452b	Seq. ID No. 979	Seq. ID No. 980	yes	IM	4
452c	Seq. ID No. 981	Seq. ID No. 982	yes	IM	4
452d	Seq. ID No. 983	Seq. ID No. 984	yes	IM	4
452e	Seq. ID No. 985	Seq. ID No. 986	yes	IM	4
460b	Seq. ID No. 1001	Seq. ID No. 1002	maybe	Cyto	1
460c	Seq. ID No. 1003	Seq. ID No. 1004	maybe	Cyto	1
462	Seq. ID No. 1005	Seq. ID No. 1006	yes	Peri	1
463a	Seq. ID No. 1007	Seq. ID No. 1008	yes	Peri	1
463b	Seq. ID No. 1009	Seq. ID No. 1010	yes	Peri	1
464a	Seq. ID No. 1011	Seq. ID No. 1012	maybe	IM	2
464b	Seq. ID No. 1013	Seq. ID No. 1014	YES	IM	9
464c	Seq. ID No. 1015	Seq. ID No. 1016	yes	IM	11
465b	Seq. ID No. 1019	Seq. ID No. 1020	yes	OM	3
472a	Seq. ID No. 1029	Seq. ID No. 1030	yes	IM	4
472b	Seq. ID No. 1031	Seq. ID No. 1032	yes	IM	5
472c	Seq. ID No. 1033	Seq. ID No. 1034	maybe	IM	7
472d	Seq. ID No. 1035	Seq. ID No. 1036	maybe	IM	8
472e	Seq. ID No. 1037	Seq. ID No. 1038	maybe	IM	8



TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
472f	Seq. ID No. 1039	Seq. ID No. 1040	YES	IM	10
476	Seq. ID No. 1045	Seq. ID No. 1046	maybe	Peri	1
480a	Seq. ID No. 1055	Seq. ID No. 1056	NO	IM	1
492	Seq. ID No. 1075	Seq. ID No. 1076	YES	OM	1
494a	Seq. ID No. 1077	Seq. ID No. 1078	NO	Cyto	1
507a	Seq. ID No. 1105	Seq. ID No. 1106	maybe	IM	1
507b	Seq. ID No. 1107	Seq. ID No. 1108	maybe	IM	1
521b	Seq. ID No. 1131	Seq. ID No. 1132	maybe	Cyto	2
524a	Seq. ID No. 1135	Seq. ID No. 1136	maybe	IM	1
524b	Seq. ID No. 1137	Seq. ID No. 1138	yes	IM	6
525	Seq. ID No. 1139	Seq. ID No. 1140	maybe	Cyto	1
530a	Seq. ID No. 1151	Seq. ID No. 1152	yes	IM	
541a	Seq. ID No. 1165	Seq. ID No. 1166	maybe	IM	2
541b	Seq. ID No. 1167	Seq. ID No. 1168	maybe	IM	4
541c	Seq. ID No. 1169	Seq. ID No. 1170	yes	IM	5
542	Seq. ID No. 1173	Seq. ID No. 1174	yes	IM	1
545a	Seq. ID No. 1183	Seq. ID No. 1184	yes	IM	3
547a	Seq. ID No. 1195	Seq. ID No. 1196	YES	OM	1
547b	Seq. ID No. 1197	Seq. ID No. 1198	YES	IM	1
550a	Seq. ID No. 1203	Seq. ID No. 1204	maybe	IM	1
556	Seq. ID No. 1213	Seq. ID No. 1214	yes	IM	2
561	Seq. ID No. 1223	Seq. ID No. 1224	yes	IM	5
564a	Seq. ID No. 1227	Seq. ID No. 1228	NO	IM	4
564b	Seq. ID No. 1229	Seq. ID No. 1230	yes	IM	4
570b	Seq. ID No. 1237	Seq. ID No. 1238	NO	IM	5
576a	Seq. ID No. 1243	Seq. ID No. 1244	YES	Peri	1
576b	Seq. ID No. 1245	Seq. ID No. 1246	YES	IM	1
585b	Seq. ID No. 1259	Seq. ID No. 1260	yes	Cyto	0
587a	Seq. ID No. 1265	Seq. ID No. 1266	maybe	IM	4

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
587b	Seq. ID No. 1267	Seq. ID No. 1268	NO	IM	5
587c	Seq. ID No. 1269	Seq. ID No. 1270	YES	IM	9
587d	Seq. ID No. 1271	Seq. ID No. 1272	NO	IM	12
595a	Seq. ID No. 1283	Seq. ID No. 1284	yes	IM	2
596a	Seq. ID No. 1287	Seq. ID No. 1288	maybe	IM	1
596b	Seq. ID No. 1289	Seq. ID No. 1290	maybe	IM	2
596c	Seq. ID No. 1291	Seq. ID No. 1292	maybe	IM	2
598a	Seq. ID No. 1295	Seq. ID No. 1296	maybe	IM	2
598b	Seq. ID No. 1297	Seq. ID No. 1298	maybe	IM	2
600a	Seq. ID No. 1303	Seq. ID No. 1304	maybe	Peri	1
600b	Seq. ID No. 1305	Seq. ID No. 1306	maybe	Peri	1
609a	Seq. ID No. 1315	Seq. ID No. 1316	YES	IM	2
609b	Seq. ID No. 1317	Seq. ID No. 1318	YES	IM	2
610a	Seq. ID No. 1319	Seq. ID No. 1320	yes	IM	1
613a	Seq. ID No. 1325	Seq. ID No. 1326	maybe	IM	6
613b	Seq. ID No. 1327	Seq. ID No. 1328	yes	IM	7
613c	Seq. ID No. 1329	Seq. ID No. 1330	NO	IM	9
613d	Seq. ID No. 1331	Seq. ID No. 1332	YES	IM	10
615b	Seq. ID No. 1337	Seq. ID No. 1338	maybe	IM	2
619a	Seq. ID No. 1341	Seq. ID No. 1342	yes	Cyto	1
619b	Seq. ID No. 1343	Seq. ID No. 1344	yes	Cyto	1
623	Seq. ID No. 1347	Seq. ID No. 1348	yes	Peri	1
624a	Seq. ID No. 1349	Seq. ID No. 1350	NO	IM	1
624b	Seq. ID No. 1351	Seq. ID No. 1352	maybe	IM	1
624c	Seq. ID No. 1353	Seq. ID No. 1354	maybe	IM	1
631b	Seq. ID No. 1365	Seq. ID No. 1366	YES	IM	2
631c	Seq. ID No. 1367	Seq. ID No. 1368	YES	IM	2
631d	Seq. ID No. 1369	Seq. ID No. 1370	YES	IM	2
632b	Seq. ID No. 1371	Seq. ID No. 1372	maybe	IM	1

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
636	Seq. ID No. 1381	Seq. ID No. 1382	maybe	Cyto	
645	Seq. ID No. 1401	Seq. ID No. 1402	yes	Peri	1
665	Seq. ID No. 1429	Seq. ID No. 1430	yes	IM	3
674a	Seq. ID No. 1435	Seq. ID No. 1436	NO	IM	1
679a	Seq. ID No. 1445	Seq. ID No. 1446	YES	Cyto	1
679b	Seq. ID No. 1447	Seq. ID No. 1448	YES	IM	1
700a	Seq. ID No. 1481	Seq. ID No. 1482	NO	IM	2
722a	Seq. ID No. 1513	Seq. ID No. 1514	YES	IM	3
722b	Seq. ID No. 1515	Seq. ID No. 1516	maybe	IM	7
722c	Seq. ID No. 1517	Seq. ID No. 1518	YES	IM	11
728a	Seq. ID No. 1529	Seq. ID No. 1530	NO	IM	6
730a	Seq. ID No. 1533	Seq. ID No. 1534	NO	IM	3
730b	Seq. ID No. 1535	Seq. ID No. 1536	maybe	IM	5
738a	Seq. ID No. 1545	Seq. ID No. 1546	YES	IM	2
738b	Seq. ID No. 1547	Seq. ID No. 1548	NO	IM	9
739	Seq. ID No. 1551	Seq. ID No. 1552	yes	IM	2
740	Seq. ID No. 1553	Seq. ID No. 1554	NO	OM	0
743a	Seq. ID No. 1559	Seq. ID No. 1560	yes	IM	2
743b	Seq. ID No. 1561	Seq. ID No. 1562	YES	IM	2
744	Seq. ID No. 1563	Seq. ID No. 1564	maybe	OM	1
746b	Seq. ID No. 1571	Seq. ID No. 1572	YES	IM	6
749	Seq. ID No. 1579	Seq. ID No. 1580	yes	IM	1
754a	Seq. ID No. 1583	Seq. ID No. 1584	NO	IM	3
754b	Seq. ID No. 1585	Seq. ID No. 1586	YES	IM	9
772a	Seq. ID No. 1621	Seq. ID No. 1622	yes	IM	5
779	Seq. ID No. 1633	Seq. ID No. 1634	yes	Peri	2
782b	Seq. ID No. 1639	Seq. ID No. 1640	NO	IM	5
786b	Seq. ID No. 1643	Seq. ID No. 1644	YES	Peri	1
788a	Seq. ID No. 1645	Seq. ID No. 1646	yes	IM	4

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
788b	Seq. ID No. 1647	Seq. ID No. 1648	yes	IM	6
789a	Seq. ID No. 1649	Seq. ID No. 1650	yes	IM	4
789c	Seq. ID No. 1653	Seq. ID No. 1654	YES	IM	5
794b	Seq. ID No. 1661	Seq. ID No. 1662	YES	OM	0
794c	Seq. ID No. 1663	Seq. ID No. 1664	YES	OM	0
794d	Seq. ID No. 1665	Seq. ID No. 1666	yes	OM	0
799a	Seq. ID No. 1671	Seq. ID No. 1672	yes	IM	2
799b	Seq. ID No. 1673	Seq. ID No. 1674	maybe	IM	4
799d	Seq. ID No. 1677	Seq. ID No. 1678	yes	IM	9
799e	Seq. ID No. 1679	Seq. ID No. 1680	yes	IM	10
799f	Seq. ID No. 1681	Seq. ID No. 1682	yes	IM	10
808	Seq. ID No. 1693	Seq. ID No. 1694	NO	Cyto	
826	Seq. ID No. 1707	Seq. ID No. 1708	YES	IM	3
829b	Seq. ID No. 1711	Seq. ID No. 1712	NO	Peri	
837a	Seq. ID No. 1731	Seq. ID No. 1732	yes	IM	2
837b	Seq. ID No. 1733	Seq. ID No. 1734	YES	IM	8
843	Seq. ID No. 1737	Seq. ID No. 1738	YES	IM	1
853a	Seq. ID No. 1753	Seq. ID No. 1754	yes	IM	3
853b	Seq. ID No. 1755	Seq. ID No. 1756	YES	IM	5
853c	Seq. ID No. 1757	Seq. ID No. 1758	maybe	IM	5
859a	Seq. ID No. 1765	Seq. ID No. 1766	YES	IM	2
859b	Seq. ID No. 1767	Seq. ID No. 1768	YES	IM	4
859d	Seq. ID No. 1771	Seq. ID No. 1772	NO	IM	6
864b	Seq. ID No. 1781	Seq. ID No. 1782	maybe	Cyto	1
868a	Seq. ID No. 1787	Seq. ID No. 1788	yes	IM	3
870	Seq. ID No. 1791	Seq. ID No. 1792	YES	OM	1
873c	Seq. ID No. 1797	Seq. ID No. 1798	yes	OM	1
876	Seq. ID No. 1805	Seq. ID No. 1806	YES	Peri	1
885	Seq. ID No. 1819	Seq. ID No. 1820	NO	IM	2

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
886	Seq. ID No. 1821	Seq. ID No. 1822	yes	OM	1
887	Seq. ID No. 1823	Seq. ID No. 1824	yes	IM	1
908a	Seq. ID No. 1839	Seq. ID No. 1840	yes	IM	6
919	Seq. ID No. 1857	Seq. ID No. 1858	maybe	Cyto	
929a	Seq. ID No. 1869	Seq. ID No. 1870	maybe	Cyto	1
931	Seq. ID No. 1875	Seq. ID No. 1876	YES	IM	2
939a	Seq. ID No. 1891	Seq. ID No. 1892	maybe	IM	9
939b	Seq. ID No. 1893	Seq. ID No. 1894	yes	IM	10
939c	Seq. ID No. 1895	Seq. ID No. 1896	NO	IM	12
950	Seq. ID No. 1915	Seq. ID No. 1916	NO	IM	1
951a	Seq. ID No. 1917	Seq. ID No. 1918	yes	OM	0
951b	Seq. ID No. 1919	Seq. ID No. 1920	yes	IM	0
952b	Seq. ID No. 1923	Seq. ID No. 1924	maybe	IM	4
955a	Seq. ID No. 1927	Seq. ID No. 1928	maybe	IM	1
955b	Seq. ID No. 1929	Seq. ID No. 1930	maybe	IM	1
977a	Seq. ID No. 1969	Seq. ID No. 1970	YES	OM	1
981a	Seq. ID No. 1981	Seq. ID No. 1982	YES	IM	1
987	Seq. ID No. 1991	Seq. ID No. 1992	yes	IM	5
988a	Seq. ID No. 1993	Seq. ID No. 1994	NO	IM	5
993	Seq. ID No. 2005	Seq. ID No. 2006	maybe	IM	0
998a	Seq. ID No. 2013	Seq. ID No. 2014	yes	IM	5
999a	Seq. ID No. 2017	Seq. ID No. 2018	yes	IM	2
999b	Seq. ID No. 2019	Seq. ID No. 2020	yes	IM	2
1003a	Seq. ID No. 2025	Seq. ID No. 2026	maybe	IM	2
1003b	Seq. ID No. 2027	Seq. ID No. 2028	maybe	IM	2
1006a	Seq. ID No. 2033	Seq. ID No. 2034	yes	Peri	1
1006b	Seq. ID No. 2035	Seq. ID No. 2036	yes	Cyto	1
1013a	Seq. ID No. 2041	Seq. ID No. 2042	maybe	IM	5
1017a	Seq. ID No. 2049	Seq. ID No. 2050	yes	IM	4

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1017c	Seq. ID No. 2053	Seq. ID No. 2054	YES	IM	6
1017d	Seq. ID No. 2055	Seq. ID No. 2056	YES	IM	6
1036a	Seq. ID No. 2087	Seq. ID No. 2088	YES	IM	3
1036b	Seq. ID No. 2089	Seq. ID No. 2090	YES	IM	4
1036c	Seq. ID No. 2091	Seq. ID No. 2092	YES	IM	4
1044a	Seq. ID No. 2105	Seq. ID No. 2106	YES	IM	2
1044b	Seq. ID No. 2107	Seq. ID No. 2108	maybe	IM	3
1044c	Seq. ID No. 2109	Seq. ID No. 2110	maybe	IM	3
1047a	Seq. ID No. 2113	Seq. ID No. 2114	yes	OM	1
1047b	Seq. ID No. 2115	Seq. ID No. 2116	YES	OM	1
1050a	Seq. ID No. 2121	Seq. ID No. 2122	maybe	IM	3
1050b	Seq. ID No. 2123	Seq. ID No. 2124	yes	IM	7
1050c	Seq. ID No. 2125	Seq. ID No. 2126	yes	IM	7
1050d	Seq. ID No. 2127	Seq. ID No. 2128	yes	IM	7
1065a	Seq. ID No. 2149	Seq. ID No. 2150	YES	Peri	1
1065b	Seq. ID No. 2151	Seq. ID No. 2152	YES	Peri	1
1066a	Seq. ID No. 2155	Seq. ID No. 2156	NO	IM	1
1066b	Seq. ID No. 2157	Seq. ID No. 2158	NO	IM	1
1067	Seq. ID No. 2159	Seq. ID No. 2160	YES	OM	1
1077a	Seq. ID No. 2171	Seq. ID No. 2172	yes	IM	3
1077b	Seq. ID No. 2173	Seq. ID No. 2174	maybe	IM	10
1077d	Seq. ID No. 2177	Seq. ID No. 2178	YES	IM	13
1081a	Seq. ID No. 2187	Seq. ID No. 2188	yes	Peri	1
1082	Seq. ID No. 2191	Seq. ID No. 2192	maybe	Peri	0
1094a	Seq. ID No. 2205	Seq. ID No. 2206	maybe	IM	2
1111a	Seq. ID No. 2237	Seq. ID No. 2238	yes	IM	6
1111b	Seq. ID No. 2239	Seq. ID No. 2240	maybe	IM	8
1125	Seq. ID No. 2245	Seq. ID No. 2246	NO	IM	4
1126b	Seq. ID No. 2249	Seq. ID No. 2250	yes	IM	4

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1126c	Seq. ID No. 2251	Seq. ID No. 2252	yes	IM	4
1128	Seq. ID No. 2255	Seq. ID No. 2256	yes	IM	2
1132	Seq. ID No. 2259	Seq. ID No. 2260	NO	Cyto	
1140a	Seq. ID No. 2271	Seq. ID No. 2272	yes	IM	2
1144a	Seq. ID No. 2283	Seq. ID No. 2284	yes	IM	2
1146a	Seq. ID No. 2289	Seq. ID No. 2290	yes	IM	3
1146b	Seq. ID No. 2291	Seq. ID No. 2292	NO	IM	5
1146c	Seq. ID No. 2293	Seq. ID No. 2294	YES	IM	7
1146d	Seq. ID No. 2295	Seq. ID No. 2296	yes	IM	8
1152a	Seq. ID No. 2303	Seq. ID No. 2304	maybe	IM	2
1152b	Seq. ID No. 2305	Seq. ID No. 2306	yes	IM	5
1152c	Seq. ID No. 2307	Seq. ID No. 2308	yes	IM	6
1155a	Seq. ID No. 2317	Seq. ID No. 2318	yes	IM	3
1155b	Seq. ID No. 2319	Seq. ID No. 2320	yes	IM	4
1155c	Seq. ID No. 2321	Seq. ID No. 2322	YES	IM	5
1155d	Seq. ID No. 2323	Seq. ID No. 2324	yes	IM	6
1155e	Seq. ID No. 2325	Seq. ID No. 2326	yes	IM	9
1155f	Seq. ID No. 2327	Seq. ID No. 2328	maybe	IM	11
1155g	Seq. ID No. 2329	Seq. ID No. 2330	maybe	IM	11
1158b	Seq. ID No. 2333	Seq. ID No. 2334	maybe	Cyto	1
1165	Seq. ID No. 2343	Seq. ID No. 2344	yes	OM	1
1167a	Seq. ID No. 2347	Seq. ID No. 2348	YES	Peri	1
1167b	Seq. ID No. 2349	Seq. ID No. 2350	yes	IM	2
1168	Seq. ID No. 2351	Seq. ID No. 2352	YES	Peri	1
1169a	Seq. ID No. 2353	Seq. ID No. 2354	YES	IM	4
1169b	Seq. ID No. 2355	Seq. ID No. 2356	maybe	IM	6
1169c	Seq. ID No. 2357	Seq. ID No. 2358	maybe	IM	8
1172	Seq. ID No. 2365	Seq. ID No. 2366	YES	IM	1
1173	Seq. ID No. 2367	Seq. ID No. 2368	maybe	IM	2

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1175	Seq. ID No. 2371	Seq. ID No. 2372	maybe	Cyto	0
1178	Seq. ID No. 2375	Seq. ID No. 2376	maybe	Cyto	1
1180c	Seq. ID No. 2387	Seq. ID No. 2388	maybe	IM	3
1180d	Seq. ID No. 2389	Seq. ID No. 2390	maybe	IM	3
1180e	Seq. ID No. 2391	Seq. ID No. 2392	maybe	IM	4
1182a	Seq. ID No. 2393	Seq. ID No. 2394	yes	IM	1
1186a	Seq. ID No. 2407	Seq. ID No. 2408	maybe	IM	5
1192a	Seq. ID No. 2419	Seq. ID No. 2420	maybe	IM	3
1192b	Seq. ID No. 2421	Seq. ID No. 2422	YES	IM	4
1196a	Seq. ID No. 2425	Seq. ID No. 2426	YES	Peri	1
1196b	Seq. ID No. 2427	Seq. ID No. 2428	YES	Peri	1
1197	Seq. ID No. 2429	Seq. ID No. 2430	YES	IM	2
1199a	Seq. ID No. 2433	Seq. ID No. 2434	maybe	IM	3
1207	Seq. ID No. 2449	Seq. ID No. 2450	YES	OM	1
1212	Seq. ID No. 2459	Seq. ID No. 2460	YES	IM	2
1224a	Seq. ID No. 2487	Seq. ID No. 2488	maybe	IM	6
1224b	Seq. ID No. 2489	Seq. ID No. 2490	maybe	IM	6
1224c	Seq. ID No. 2491	Seq. ID No. 2492	yes	IM	6
1225	Seq. ID No. 2493	Seq. ID No. 2494	NO	Cyto	1
1228a	Seq. ID No. 2497	Seq. ID No. 2498	yes	IM	1
1228b	Seq. ID No. 2499	Seq. ID No. 2500	yes	IM	2
1229b	Seq. ID No. 2501	Seq. ID No. 2502	NO	Cyto	2
1229c	Seq. ID No. 2503	Seq. ID No. 2504	NO	Cyto	2
1231	Seq. ID No. 2507	Seq. ID No. 2508	yes	OM	1
1234a	Seq. ID No. 2515	Seq. ID No. 2516	yes	IM	4
1234b	Seq. ID No. 2517	Seq. ID No. 2518	yes	IM	4
1236a	Seq. ID No. 2523	Seq. ID No. 2524	yes	IM	2
1237	Seq. ID No. 2525	Seq. ID No. 2526	YES	OM	1
1239	Seq. ID No. 2527	Seq. ID No. 2528	yes	OM	1



TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1241a	Seq. ID No. 2531	Seq. ID No. 2532	YES	IM	2
1241b	Seq. ID No. 2533	Seq. ID No. 2534	yes	IM	7
1241c	Seq. ID No. 2535	Seq. ID No. 2536	yes	IM	7
1243	Seq. ID No. 2537	Seq. ID No. 2538	maybe	IM	4
1245a	Seq. ID No. 2541	Seq. ID No. 2542	yes	IM	6
1245b	Seq. ID No. 2543	Seq. ID No. 2544	yes	IM	10
1245c	Seq. ID No. 2545	Seq. ID No. 2546	maybe	IM	11
1250a	Seq. ID No. 2555	Seq. ID No. 2556	maybe	IM	2
1250b	Seq. ID No. 2557	Seq. ID No. 2558	yes	IM	8
1251a	Seq. ID No. 2565	Seq. ID No. 2566	maybe	IM	3
1253a	Seq. ID No. 2569	Seq. ID No. 2570	maybe	OM	1
1253b	Seq. ID No. 2571	Seq. ID No. 2572	maybe	OM	2
1258a	Seq. ID No. 2583	Seq. ID No. 2584	yes	IM	5
1260	Seq. ID No. 2591	Seq. ID No. 2592	maybe	Cyto	1
1266a	Seq. ID No. 2597	Seq. ID No. 2598	NO	IM	6
1266b	Seq. ID No. 2599	Seq. ID No. 2600	maybe	IM	7
1267a	Seq. ID No. 2601	Seq. ID No. 2602	yes	IM	2
1268b	Seq. ID No. 2607	Seq. ID No. 2608	YES	IM	5
1270	Seq. ID No. 2611	Seq. ID No. 2612	maybe	IM	2
1275a	Seq. ID No. 2621	Seq. ID No. 2622	yes	Cyto	1
1278a	Seq. ID No. 2627	Seq. ID No. 2628	NO	IM	1
1278b	Seq. ID No. 2629	Seq. ID No. 2630	NO	IM	2
1288	Seq. ID No. 2651	Seq. ID No. 2652	YES	IM	1
1308a	Seq. ID No. 2679	Seq. ID No. 2680	YES	IM	3
1308b	Seq. ID No. 2681	Seq. ID No. 2682	yes	IM	4
1308c	Seq. ID No. 2683	Seq. ID No. 2684	maybe	IM	4
1314b	Seq. ID No. 2691	Seq. ID No. 2692	yes	IM	1
1315	Seq. ID No. 2693	Seq. ID No. 2694	YES	IM	2
1316	Seq. ID No. 2695	Seq. ID No. 2696	maybe	IM	

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1317	Seq. ID No. 2697	Seq. ID No. 2698	NO	Cyto	1
1318	Seq. ID No. 2699	Seq. ID No. 2700	YES	IM	0
1319a	Seq. ID No. 2701	Seq. ID No. 2702	yes	IM	4
1319b	Seq. ID No. 2703	Seq. ID No. 2704	YES	IM	5
1320a	Seq. ID No. 2705	Seq. ID No. 2706	maybe	IM	2
1320b	Seq. ID No. 2707	Seq. ID No. 2708	NO	IM	4
1323b	Seq. ID No. 2717	Seq. ID No. 2718	maybe	OM	1
1334a	Seq. ID No. 2729	Seq. ID No. 2730	maybe	IM	2
1334b	Seq. ID No. 2731	Seq. ID No. 2732	maybe	OM	2
1335a	Seq. ID No. 2733	Seq. ID No. 2734	yes	OM	2
1365b	Seq. ID No. 2783	Seq. ID No. 2784	maybe	IM	2
1366a	Seq. ID No. 2785	Seq. ID No. 2786	YES	Peri	1
1375	Seq. ID No. 2801	Seq. ID No. 2802	yes	Cyto	0
1380	Seq. ID No. 2809	Seq. ID No. 2810	NO	IM	2
1381b	Seq. ID No. 2813	Seq. ID No. 2814	YES	IM	2
1382	Seq. ID No. 2815	Seq. ID No. 2816	yes	OM	1
1384a	Seq. ID No. 2819	Seq. ID No. 2820	yes	IM	2
1384b	Seq. ID No. 2821	Seq. ID No. 2822	yes	IM	2
1384c	Seq. ID No. 2823	Seq. ID No. 2824	yes	IM	2
1388b	Seq. ID No. 2831	Seq. ID No. 2832	maybe	Cyto	
1389a	Seq. ID No. 2833	Seq. ID No. 2834	yes	Cyto	0
1393a	Seq. ID No. 2835	Seq. ID No. 2836	YES	Peri	1
1393b	Seq. ID No. 2837	Seq. ID No. 2838	yes	IM	2
1393c	Seq. ID No. 2839	Seq. ID No. 2840	yes	IM	3
1393d	Seq. ID No. 2841	Seq. ID No. 2842	YES	IM	3
1395a	Seq. ID No. 2845	Seq. ID No. 2846	yes	Cyto	
1399a	Seq. ID No. 2853	Seq. ID No. 2854	yes	IM	2
1399b	Seq. ID No. 2855	Seq. ID No. 2856	maybe	IM	2
1401	Seq. ID No. 2859	Seq. ID No. 2860	NO	IM	1

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1402c	Seq. ID No. 2861	Seq. ID No. 2862	yes	IM	2
1411a	Seq. ID No. 2873	Seq. ID No. 2874	yes	IM	3
1412b	Seq. ID No. 2881	Seq. ID No. 2882	YES	IM	9
1418	Seq. ID No. 2893	Seq. ID No. 2894	maybe	Cyto	
1426a	Seq. ID No. 2905	Seq. ID No. 2906	yes	IM	4
1438	Seq. ID No. 2935	Seq. ID No. 2936	YES	OM	1
1439a	Seq. ID No. 2937	Seq. ID No. 2938	YES	IM	3
1439b	Seq. ID No. 2939	Seq. ID No. 2940	yes	IM	5
1439c	Seq. ID No. 2941	Seq. ID No. 2942	yes	IM	6
1440a	Seq. ID No. 2947	Seq. ID No. 2948	yes	IM	6
1440b	Seq. ID No. 2949	Seq. ID No. 2950	YES	IM	10
1440c	Seq. ID No. 2951	Seq. ID No. 2952	maybe	IM	12
1447a	Seq. ID No. 2969	Seq. ID No. 2970	NO	IM	10
1448	Seq. ID No. 2973	Seq. ID No. 2974	YES	IM	1
1449a	Seq. ID No. 2975	Seq. ID No. 2976	maybe	OM	1
1449b	Seq. ID No. 2977	Seq. ID No. 2978	maybe	OM	1
1452a	Seq. ID No. 2981	Seq. ID No. 2982	yes	IM	4
1452b	Seq. ID No. 2983	Seq. ID No. 2984	yes	IM	4
1454	Seq. ID No. 2987	Seq. ID No. 2988	yes	Cyto	1
1455b	Seq. ID No. 2991	Seq. ID No. 2992	yes	OM	1
1457a	Seq. ID No. 2995	Seq. ID No. 2996	yes	IM	3
1457b	Seq. ID No. 2997	Seq. ID No. 2998	maybe	IM	4
1462b	Seq. ID No. 3005	Seq. ID No. 3006	yes	IM	6
1463a	Seq. ID No. 3007	Seq. ID No. 3008	YES	IM	2
1463b	Seq. ID No. 3009	Seq. ID No. 3010	YES	IM	2
1463c	Seq. ID No. 3011	Seq. ID No. 3012	YES	IM	2
1466a	Seq. ID No. 3013	Seq. ID No. 3014	maybe	IM	1
1469a	Seq. ID No. 3023	Seq. ID No. 3024	NO	IM	4
1469b	Seq. ID No. 3025	Seq. ID No. 3026	yes	IM	5

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1469c	Seq. ID No. 3027	Seq. ID No. 3028	maybe	IM	11
1470a	Seq. ID No. 3029	Seq. ID No. 3030	YES	IM	5
1470b	Seq. ID No. 3031	Seq. ID No. 3032	YES	IM	7
1475	Seq. ID No. 3043	Seq. ID No. 3044	yes	OM	1
1479c	Seq. ID No. 3055	Seq. ID No. 3056	NO	Peri	1
1484a	Seq. ID No. 3063	Seq. ID No. 3064	maybe	IM	4
1487	Seq. ID No. 3071	Seq. ID No. 3072	maybe	OM	2
1488a	Seq. ID No. 3073	Seq. ID No. 3074	yes	IM	1
1488b	Seq. ID No. 3075	Seq. ID No. 3076	yes	IM	2
1488c	Seq. ID No. 3077	Seq. ID No. 3078	maybe	IM	3
1507a	Seq. ID No. 3119	Seq. ID No. 3120	NO	IM	2
1507b	Seq. ID No. 3121	Seq. ID No. 3122	NO	IM	2
1507c	Seq. ID No. 3123	Seq. ID No. 3124	maybe	IM	2
1517a	Seq. ID No. 3145	Seq. ID No. 3146	NO	Peri	1
1520	Seq. ID No. 3155	Seq. ID No. 3156	yes	Peri	1
1522	Seq. ID No. 3157	Seq. ID No. 3158	NO	Peri	1
1530a	Seq. ID No. 3163	Seq. ID No. 3164	yes	OM	1
1530b	Seq. ID No. 3165	Seq. ID No. 3166	yes	IM	1
1535a	Seq. ID No. 3173	Seq. ID No. 3174	maybe	Cyto	1
1543	Seq. ID No. 3183	Seq. ID No. 3184	yes	OM	1
1552	Seq. ID No. 3193	Seq. ID No. 3194	maybe	IM	2
1554b	Seq. ID No. 3201	Seq. ID No. 3202	maybe	IM	2
1557a	Seq. ID No. 3213	Seq. ID No. 3214	yes	IM	4
1557b	Seq. ID No. 3215	Seq. ID No. 3216	yes	IM	5
1557c	Seq. ID No. 3217	Seq. ID No. 3218	maybe	IM	6
1559a	Seq. ID No. 3219	Seq. ID No. 3220	YES	IM	4
1572a	Seq. ID No. 3241	Seq. ID No. 3242	maybe	IM	2
1572b	Seq. ID No. 3243	Seq. ID No. 3244	NO	IM	8
1572c	Seq. ID No. 3245	Seq. ID No. 3246	yes	IM	10

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1572e	Seq. ID No. 3249	Seq. ID No. 3250	NO	IM	12
1577a	Seq. ID No. 3255	Seq. ID No. 3256	maybe	IM	4
1577b	Seq. ID No. 3257	Seq. ID No. 3258	maybe	IM	4
1580a	Seq. ID No. 3261	Seq. ID No. 3262	yes	IM	1
1580b	Seq. ID No. 3263	Seq. ID No. 3264	yes	IM	1
1582b	Seq. ID No. 3269	Seq. ID No. 3270	yes	IM	1
1585a	Seq. ID No. 3275	Seq. ID No. 3276	yes	IM	1
1585b	Seq. ID No. 3277	Seq. ID No. 3278	yes	IM	1
1594a	Seq. ID No. 3297	Seq. ID No. 3298	YES	IM	1
1606a	Seq. ID No. 3317	Seq. ID No. 3318	yes	IM	1
1607b	Seq. ID No. 3323	Seq. ID No. 3324	maybe	IM	6
1608	Seq. ID No. 3325	Seq. ID No. 3326	yes	Cyto	1
1612	Seq. ID No. 3331	Seq. ID No. 3332	YES	IM	3
1616b	Seq. ID No. 3335	Seq. ID No. 3336	YES	IM	4
1619	Seq. ID No. 3337	Seq. ID No. 3338	yes	OM	1
1621	Seq. ID No. 3339	Seq. ID No. 3340	maybe	IM	1
1624	Seq. ID No. 3349	Seq. ID No. 3350	YES	Peri	1
1625a	Seq. ID No. 3351	Seq. ID No. 3352	yes	IM	4
1625b	Seq. ID No. 3353	Seq. ID No. 3354	YES	IM	8
1625c	Seq. ID No. 3355	Seq. ID No. 3356	YES	IM	8
1626a	Seq. ID No. 3357	Seq. ID No. 3358	maybe	IM	4
1626b	Seq. ID No. 3359	Seq. ID No. 3360	maybe	IM	9
1634b	Seq. ID No. 3375	Seq. ID No. 3376	maybe	OM	0
1634c	Seq. ID No. 3377	Seq. ID No. 3378	YES	IM	1
1646a	Seq. ID No. 3389	Seq. ID No. 3390	yes	IM	2
1646b	Seq. ID No. 3391	Seq. ID No. 3392	YES	IM	6
1646d	Seq. ID No. 3395	Seq. ID No. 3396	maybe	IM	13
1649a	Seq. ID No. 3405	Seq. ID No. 3406	yes	Peri	2
1654	Seq. ID No. 3415	Seq. ID No. 3416	maybe	Peri	0

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1659a	Seq. ID No. 3421	Seq. ID No. 3422	yes	OM	1
1659c	Seq. ID No. 3425	Seq. ID No. 3426	YES	IM	10
1660b	Seq. ID No. 3427	Seq. ID No. 3428	maybe	IM	4
1663	Seq. ID No. 3433	Seq. ID No. 3434	maybe	Cyto	0
1669	Seq. ID No. 3441	Seq. ID No. 3442	maybe	Cyto	1
1673a	Seq. ID No. 3449	Seq. ID No. 3450	YES	IM	2
1673b	Seq. ID No. 3451	Seq. ID No. 3452	yes	IM	8
1673c	Seq. ID No. 3453	Seq. ID No. 3454	yes	IM	10
1673d	Seq. ID No. 3455	Seq. ID No. 3456	yes	IM	12
1673e	Seq. ID No. 3457	Seq. ID No. 3458	maybe	IM	13
1675a	Seq. ID No. 3463	Seq. ID No. 3464	maybe	IM	1
1683a	Seq. ID No. 3481	Seq. ID No. 3482	maybe	IM	4
1688a	Seq. ID No. 3491	Seq. ID No. 3492	yes	IM	3
1688b	Seq. ID No. 3493	Seq. ID No. 3494	YES	IM	10
1690a	Seq. ID No. 3503	Seq. ID No. 3504	yes	IM	1
1690b	Seq. ID No. 3505	Seq. ID No. 3506	yes	IM	2
1694c	Seq. ID No. 3517	Seq. ID No. 3518	yes	IM	1
1694d	Seq. ID No. 3519	Seq. ID No. 3520	yes	IM	1
1699a	Seq. ID No. 3527	Seq. ID No. 3528	maybe	IM	7
1700a	Seq. ID No. 3531	Seq. ID No. 3532	maybe	IM	4
1703b	Seq. ID No. 3539	Seq. ID No. 3540	NO	Cyto	0
1710b	Seq. ID No. 3561	Seq. ID No. 3562	NO	Cyto	
1718b	Seq. ID No. 3573	Seq. ID No. 3574	YES	Cyto	
1724	Seq. ID No. 3581	Seq. ID No. 3582	maybe	IM	2
1731	Seq. ID No. 3587	Seq. ID No. 3588	NO	IM	2
1735a	Seq. ID No. 3593	Seq. ID No. 3594	yes	OM	1
1735b	Seq. ID No. 3595	Seq. ID No. 3596	maybe	OM	3
1743	Seq. ID No. 3611	Seq. ID No. 3612	YES	IM	1
1745	Seq. ID No. 3617	Seq. ID No. 3618	yes	Peri	0

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1747	Seq. ID No. 3619	Seq. ID No. 3620	YES	IM	2
1749a	Seq. ID No. 3621	Seq. ID No. 3622	yes	IM	3
1750a	Seq. ID No. 3625	Seq. ID No. 3626	maybe	IM	2
1752b	Seq. ID No. 3629	Seq. ID No. 3630	yes	Peri	1
1756b	Seq. ID No. 3635	Seq. ID No. 3636	maybe	OM	1
1778a	Seq. ID No. 3677	Seq. ID No. 3678	maybe	IM	1
1778b	Seq. ID No. 3679	Seq. ID No. 3680	maybe	Cyto	1
1784b	Seq. ID No. 3689	Seq. ID No. 3690	YES	IM	1
1794a	Seq. ID No. 3717	Seq. ID No. 3718	maybe	OM	1
1798a	Seq. ID No. 3723	Seq. ID No. 3724	yes	IM	2
1798c	Seq. ID No. 3727	Seq. ID No. 3728	maybe	IM	4
1805	Seq. ID No. 3741	Seq. ID No. 3742	yes	IM	3
1806b	Seq. ID No. 3745	Seq. ID No. 3746	yes	IM	5
1808a	Seq. ID No. 3753	Seq. ID No. 3754	YES	IM	3
1808b	Seq. ID No. 3755	Seq. ID No. 3756	YES	IM	5
1808c	Seq. ID No. 3757	Seq. ID No. 3758	maybe	IM	9
1809a	Seq. ID No. 3761	Seq. ID No. 3762	maybe	IM	5
1809b	Seq. ID No. 3763	Seq. ID No. 3764	yes	IM	7
1809c	Seq. ID No. 3765	Seq. ID No. 3766	YES	IM	8
1812a	Seq. ID No. 3781	Seq. ID No. 3782	YES	IM	1
1812b	Seq. ID No. 3783	Seq. ID No. 3784	YES	IM	2
1816a	Seq. ID No. 3793	Seq. ID No. 3794	yes	Peri	1
1817a	Seq. ID No. 3799	Seq. ID No. 3800	maybe	IM	3
1822	Seq. ID No. 3807	Seq. ID No. 3808	maybe	Cyto	1
1825	Seq. ID No. 3813	Seq. ID No. 3814	yes	IM	2
1826a	Seq. ID No. 3815	Seq. ID No. 3816	NO	Cyto	0
1826b	Seq. ID No. 3817	Seq. ID No. 3818	NO	Cyto	0
1838a	Seq. ID No. 3837	Seq. ID No. 3838	yes	IM	3
1838b	Seq. ID No. 3839	Seq. ID No. 3840	yes	IM	4

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1842a	Seq. ID No. 3849	Seq. ID No. 3850	maybe	IM	2
1842b	Seq. ID No. 3851	Seq. ID No. 3852	YES	IM	6
1842c	Seq. ID No. 3853	Seq. ID No. 3854	maybe	IM	8
1845a	Seq. ID No. 3859	Seq. ID No. 3860	maybe	IM	3
1845b	Seq. ID No. 3861	Seq. ID No. 3862	yes	IM	8
1845c	Seq. ID No. 3863	Seq. ID No. 3864	maybe	IM	10
1848a	Seq. ID No. 3865	Seq. ID No. 3866	yes	IM	7
1854a	Seq. ID No. 3879	Seq. ID No. 3880	NO	IM	3
1857b	Seq. ID No. 3889	Seq. ID No. 3890	yes	IM	5
1857c	Seq. ID No. 3891	Seq. ID No. 3892	yes	IM	6
1858	Seq. ID No. 3895	Seq. ID No. 3896	yes	Cyto	0
1862a	Seq. ID No. 3903	Seq. ID No. 3904	YES	IM	1
1868	Seq. ID No. 3915	Seq. ID No. 3916	yes	IM	1
1873b	Seq. ID No. 3923	Seq. ID No. 3924	yes	Peri	1
1873c	Seq. ID No. 3925	Seq. ID No. 3926	yes	Peri	1
1894c	Seq. ID No. 3959	Seq. ID No. 3960	maybe	IM	1
1896a	Seq. ID No. 3963	Seq. ID No. 3964	maybe	Peri	1
1898a	Seq. ID No. 3973	Seq. ID No. 3974	maybe	IM	2
1898b	Seq. ID No. 3975	Seq. ID No. 3976	yes	IM	4
1916	Seq. ID No. 3993	Seq. ID No. 3994	maybe	IM	1
1917a	Seq. ID No. 3995	Seq. ID No. 3996	yes	IM	0
1917b	Seq. ID No. 3997	Seq. ID No. 3998	yes	IM	0
1919a	Seq. ID No. 4005	Seq. ID No. 4006	YES	Peri	1
1919b	Seq. ID No. 4007	Seq. ID No. 4008	YES	IM	1
1919c	Seq. ID No. 4009	Seq. ID No. 4010	yes	IM	1
1931a	Seq. ID No. 4025	Seq. ID No. 4026	NO	IM	2
1931b	Seq. ID No. 4027	Seq. ID No. 4028	YES	IM	3
1936	Seq. ID No. 4039	Seq. ID No. 4040	yes	IM	6
1937a	Seq. ID No. 4041	Seq. ID No. 4042	yes	IM	2



TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
1937b	Seq. ID No. 4043	Seq. ID No. 4044	maybe	IM	3
1937c	Seq. ID No. 4045	Seq. ID No. 4046	maybe	IM	4
1937d	Seq. ID No. 4047	Seq. ID No. 4048	maybe	IM	7
1937e	Seq. ID No. 4049	Seq. ID No. 4050	maybe	IM	7
1941b	Seq. ID No. 4061	Seq. ID No. 4062	yes	IM	4
1946a	Seq. ID No. 4071	Seq. ID No. 4072	NO	IM	4
1946b	Seq. ID No. 4073	Seq. ID No. 4074	YES	IM	8
1950	Seq. ID No. 4079	Seq. ID No. 4080	yes	OM	1
1951a	Seq. ID No. 4081	Seq. ID No. 4082	yes	IM	3
1951b	Seq. ID No. 4083	Seq. ID No. 4084	maybe	IM	4
1958a	Seq. ID No. 4101	Seq. ID No. 4102	maybe	IM	4
1958b	Seq. ID No. 4103	Seq. ID No. 4104	maybe	IM	7
1960c	Seq. ID No. 4111	Seq. ID No. 4112	yes	IM	1
1970b	Seq. ID No. 4133	Seq. ID No. 4134	maybe	OM	1
1972	Seq. ID No. 4135	Seq. ID No. 4136	yes	Cyto	1
1973	Seq. ID No. 4137	Seq. ID No. 4138	YES	OM	1
1976	Seq. ID No. 4139	Seq. ID No. 4140	yes	IM	1
1977a	Seq. ID No. 4141	Seq. ID No. 4142	YES	OM	1
1977b	Seq. ID No. 4143	Seq. ID No. 4144	YES	OM	1
1977c	Seq. ID No. 4145	Seq. ID No. 4146	YES	OM	1
1980a	Seq. ID No. 4151	Seq. ID No. 4152	NO	Cyto	1
1980b	Seq. ID No. 4153	Seq. ID No. 4154	maybe	Cyto	1
1991	Seq. ID No. 4181	Seq. ID No. 4182	yes	Cyto	1
2016a	Seq. ID No. 4221	Seq. ID No. 4222	yes	IM	2
2016b	Seq. ID No. 4223	Seq. ID No. 4224	maybe	IM	4
2016c	Seq. ID No. 4225	Seq. ID No. 4226	YES	IM	7
2016d	Seq. ID No. 4227	Seq. ID No. 4228	maybe	IM	11
2016f	Seq. ID No. 4231	Seq. ID No. 4232	maybe	IM	13
2016g	Seq. ID No. 4233	Seq. ID No. 4234	NO	IM	13

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
2023a	Seq. ID No. 4241	Seq. ID No. 4242	maybe	IM	4
2024b	Seq. ID No. 4247	Seq. ID No. 4248	yes	IM	2
2025	Seq. ID No. 4253	Seq. ID No. 4254	yes	OM	1
2030a	Seq. ID No. 4257	Seq. ID No. 4258	yes	IM	4
2030b	Seq. ID No. 4259	Seq. ID No. 4260	yes	IM	5
2030c	Seq. ID No. 4261	Seq. ID No. 4262	yes	IM	5
2030d	Seq. ID No. 4263	Seq. ID No. 4264	yes	IM	5
2032c	Seq. ID No. 4265	Seq. ID No. 4266	maybe	Cyto	
2035b	Seq. ID No. 4269	Seq. ID No. 4270	yes	Cyto	0
2038a	Seq. ID No. 4275	Seq. ID No. 4276	NO	Cyto	0
2045a	Seq. ID No. 4285	Seq. ID No. 4286	maybe	Cyto	1
2045b	Seq. ID No. 4287	Seq. ID No. 4288	maybe	Cyto	1
2049c	Seq. ID No. 4297	Seq. ID No. 4298	maybe	Cyto	
2056	Seq. ID No. 4307	Seq. ID No. 4308	maybe	Peri	1
2059a	Seq. ID No. 4311	Seq. ID No. 4312	yes	IM	2
2059b	Seq. ID No. 4313	Seq. ID No. 4314	maybe	IM	4
2074b	Seq. ID No. 4343	Seq. ID No. 4344	YES	OM	1
2092	Seq. ID No. 4379	Seq. ID No. 4380	yes	IM	2
2096a	Seq. ID No. 4385	Seq. ID No. 4386	YES	IM	4
2096c	Seq. ID No. 4389	Seq. ID No. 4390	yes	IM	10
2096d	Seq. ID No. 4391	Seq. ID No. 4392	yes	IM	10
2101	Seq. ID No. 4399	Seq. ID No. 4400	YES	Peri	1
2105	Seq. ID No. 4403	Seq. ID No. 4404	maybe	Cyto	1
2120a	Seq. ID No. 4437	Seq. ID No. 4438	NO	IM	1
2120b	Seq. ID No. 4439	Seq. ID No. 4440	NO	IM	1
2122b	Seq. ID No. 4441	Seq. ID No. 4442	maybe	IM	4
2140a	Seq. ID No. 4469	Seq. ID No. 4470	YES	IM	4
2142a	Seq. ID No. 4473	Seq. ID No. 4474	yes	IM	1
2146	Seq. ID No. 4481	Seq. ID No. 4482	yes	OM	1

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
2147a	Seq. ID No. 4483	Seq. ID No. 4484	YES	IM	2
2147b	Seq. ID No. 4485	Seq. ID No. 4486	maybe	IM	5
2150a	Seq. ID No. 4493	Seq. ID No. 4494	YES	IM	1
2150b	Seq. ID No. 4495	Seq. ID No. 4496	YES	IM	2
2150c	Seq. ID No. 4497	Seq. ID No. 4498	maybe	IM	2
2159a	Seq. ID No. 4513	Seq. ID No. 4514	maybe	IM	2
2159b	Seq. ID No. 4515	Seq. ID No. 4516	maybe	IM	2
2161b	Seq. ID No. 4527	Seq. ID No. 4528	maybe	Cyto	1
2161c	Seq. ID No. 4529	Seq. ID No. 4530	maybe	Cyto	1
2165	Seq. ID No. 4533	Seq. ID No. 4534	YES	IM	1
2190a	Seq. ID No. 4587	Seq. ID No. 4588	maybe	IM	1
2190b	Seq. ID No. 4589	Seq. ID No. 4590	NO	Peri	1
2219a	Seq. ID No. 4639	Seq. ID No. 4640	yes	IM	1
2219b	Seq. ID No. 4641	Seq. ID No. 4642	maybe	IM	4
2219c	Seq. ID No. 4643	Seq. ID No. 4644	maybe	IM	4
2225	Seq. ID No. 4659	Seq. ID No. 4660	yes	OM	0
2236a	Seq. ID No. 4681	Seq. ID No. 4682	yes	IM	2
2239b	Seq. ID No. 4687	Seq. ID No. 4688	maybe	Cyto	0
2243a	Seq. ID No. 4695	Seq. ID No. 4696	maybe	IM	2
2249	Seq. ID No. 4705	Seq. ID No. 4706	yes	OM	1
2253a	Seq. ID No. 4707	Seq. ID No. 4708	NO	IM	2
2253b	Seq. ID No. 4709	Seq. ID No. 4710	YES	IM	4
2253c	Seq. ID No. 4711	Seq. ID No. 4712	YES	IM	5
2255a	Seq. ID No. 4715	Seq. ID No. 4716	NO	IM	3
2255b	Seq. ID No. 4717	Seq. ID No. 4718	yes	IM	6
2264b	Seq. ID No. 4737	Seq. ID No. 4738	yes	IM	1
2276a	Seq. ID No. 4759	Seq. ID No. 4760	NO	IM	1
2300	Seq. ID No. 4813	Seq. ID No. 4814	yes	IM	4
2308	Seq. ID No. 4827	Seq. ID No. 4828	YES	OM	1

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
2320	Seq. ID No. 4853	Seq. ID No. 4854	maybe	IM	1
2324	Seq. ID No. 4863	Seq. ID No. 4864	maybe	IM	2
2329a	Seq. ID No. 4869	Seq. ID No. 4870	yes	IM	1
2329b	Seq. ID No. 4871	Seq. ID No. 4872	YES	IM	3
2329c	Seq. ID No. 4873	Seq. ID No. 4874	YES	IM	6
2329d	Seq. ID No. 4875	Seq. ID No. 4876	yes	IM	7
2357	Seq. ID No. 4919	Seq. ID No. 4920	yes	IM	2
2358	Seq. ID No. 4921	Seq. ID No. 4922	YES	IM	2
2360	Seq. ID No. 4923	Seq. ID No. 4924	NO	Cyto	1
2363a	Seq. ID No. 4929	Seq. ID No. 4930	yes	IM	1
2363b	Seq. ID No. 4931	Seq. ID No. 4932	yes	IM	1
2371a	Seq. ID No. 4949	Seq. ID No. 4950	NO	IM	1
2372	Seq. ID No. 4951	Seq. ID No. 4952	maybe	Peri	1
2382c	Seq. ID No. 4975	Seq. ID No. 4976	maybe	Cyto	
2390	Seq. ID No. 4987	Seq. ID No. 4988	NO	Peri	1
2397	Seq. ID No. 4999	Seq. ID No. 5000	maybe	Peri	0
2402b	Seq. ID No. 5013	Seq. ID No. 5014	maybe	IM	1
2412	Seq. ID No. 5031	Seq. ID No. 5032	yes	IM	2
2423a	Seq. ID No. 5061	Seq. ID No. 5062	yes	IM	5
2423b	Seq. ID No. 5063	Seq. ID No. 5064	yes	IM	5
2424c	Seq. ID No. 5069	Seq. ID No. 5070	yes	IM	1
2434	Seq. ID No. 5085	Seq. ID No. 5086	maybe	Cyto	1
2445	Seq. ID No. 5103	Seq. ID No. 5104	yes	IM	1
2453	Seq. ID No. 5115	Seq. ID No. 5116	YES	OM	0
2456c	Seq. ID No. 5123	Seq. ID No. 5124	yes	IM	8
2456d	Seq. ID No. 5125	Seq. ID No. 5126	maybe	IM	9
2458a	Seq. ID No. 5129	Seq. ID No. 5130	maybe	IM	5
2458b	Seq. ID No. 5131	Seq. ID No. 5132	yes	IM	6
2458c	Seq. ID No. 5133	Seq. ID No. 5134	yes	IM	7

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
2458d	Seq. ID No. 5135	Seq. ID No. 5136	yes	IM	7
2458e	Seq. ID No. 5137	Seq. ID No. 5138	yes	IM	8
2458f	Seq. ID No. 5139	Seq. ID No. 5140	yes	IM	9
2458g	Seq. ID No. 5141	Seq. ID No. 5142	yes	IM	9
2468a	Seq. ID No. 5159	Seq. ID No. 5160	yes	IM	1
2469b	Seq. ID No. 5165	Seq. ID No. 5166	yes	IM	2
2474b	Seq. ID No. 5175	Seq. ID No. 5176	yes	IM	3
2484a	Seq. ID No. 5197	Seq. ID No. 5198	maybe	Peri	1
2484b	Seq. ID No. 5199	Seq. ID No. 5200	maybe	Peri	1
2490	Seq. ID No. 5205	Seq. ID No. 5206	yes	IM	1
2492a	Seq. ID No. 5207	Seq. ID No. 5208	yes	IM	1
2495a	Seq. ID No. 5213	Seq. ID No. 5214	maybe	IM	9
2497b	Seq. ID No. 5219	Seq. ID No. 5220	yes	Peri	2
2500a	Seq. ID No. 5223	Seq. ID No. 5224	yes	OM	1
2518a	Seq. ID No. 5267	Seq. ID No. 5268	YES	Cyto	1
2520a	Seq. ID No. 5273	Seq. ID No. 5274	NO	Cyto	0
2520b	Seq. ID No. 5275	Seq. ID No. 5276	NO	Cyto	0
2520c	Seq. ID No. 5277	Seq. ID No. 5278	NO	Cyto	0
2520d	Seq. ID No. 5279	Seq. ID No. 5280	NO	Cyto	0
2521	Seq. ID No. 5281	Seq. ID No. 5282	maybe	IM	3
2525a	Seq. ID No. 5285	Seq. ID No. 5286	yes	IM	1
2546	Seq. ID No. 5327	Seq. ID No. 5328	NO	Cyto	1
2547b	Seq. ID No. 5329	Seq. ID No. 5330	yes	IM	1
2547c	Seq. ID No. 5331	Seq. ID No. 5332	yes	IM	1
2550c	Seq. ID No. 5341	Seq. ID No. 5342	YES	IM	
2564b	Seq. ID No. 5377	Seq. ID No. 5378	yes	OM	1
2564c	Seq. ID No. 5379	Seq. ID No. 5380	yes	OM	1
2567a	Seq. ID No. 5385	Seq. ID No. 5386	yes	IM	4
2567b	Seq. ID No. 5387	Seq. ID No. 5388	YES	IM	5

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
2582a	Seq. ID No. 5405	Seq. ID No. 5406	yes	IM	4
2587a	Seq. ID No. 5413	Seq. ID No. 5414	NO	Peri	2
2587b	Seq. ID No. 5415	Seq. ID No. 5416	maybe	IM	5
2596	Seq. ID No. 5433	Seq. ID No. 5434	NO	IM	1
2610	Seq. ID No. 5453	Seq. ID No. 5454	yes	IM	1
2616a	Seq. ID No. 5459	Seq. ID No. 5460	yes	IM	2
2616b	Seq. ID No. 5461	Seq. ID No. 5462	yes	IM	3
2616c	Seq. ID No. 5463	Seq. ID No. 5464	yes	IM	4
2616d	Seq. ID No. 5465	Seq. ID No. 5466	YES	IM	5
2623b	Seq. ID No. 5491	Seq. ID No. 5492	maybe	OM	1
2625a	Seq. ID No. 5497	Seq. ID No. 5498	YES	Peri	1
2628	Seq. ID No. 5509	Seq. ID No. 5510	yes	IM	1
2629b	Seq. ID No. 5513	Seq. ID No. 5514	YES	OM	1
2631	Seq. ID No. 5515	Seq. ID No. 5516	NO	Cyto	1
2632	Seq. ID No. 5517	Seq. ID No. 5518	NO	Cyto	1
2633d	Seq. ID No. 5525	Seq. ID No. 5526	maybe	OM	1
2637a	Seq. ID No. 5529	Seq. ID No. 5530	yes	OM	1
2637b	Seq. ID No. 5531	Seq. ID No. 5532	yes	IM	1
2642	Seq. ID No. 5533	Seq. ID No. 5534	NO	IM	2
2648a	Seq. ID No. 5543	Seq. ID No. 5544	YES	IM	0
2648b	Seq. ID No. 5545	Seq. ID No. 5546	YES	IM	0
2660	Seq. ID No. 5569	Seq. ID No. 5570	yes	Peri	1
2669a	Seq. ID No. 5587	Seq. ID No. 5588	YES	Peri	2
2669b	Seq. ID No. 5589	Seq. ID No. 5590	YES	IM	2
2669c	Seq. ID No. 5591	Seq. ID No. 5592	YES	IM	2
2672	Seq. ID No. 5593	Seq. ID No. 5594	NO	IM	3
2673	Seq. ID No. 5595	Seq. ID No. 5596	maybe	IM	2
2674a	Seq. ID No. 5597	Seq. ID No. 5598	maybe	IM	4
2679a	Seq. ID No. 5609	Seq. ID No. 5610	NO	IM	4

**TABLE 5: SIGNALP: SIGNAL PEPTIDE**

<b>ORF</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>SignalP</b>	<b>PSORT</b>	<b>MSD</b>
2679b	Seq. ID No. 5611	Seq. ID No. 5612	YES	IM	5
2680c	Seq. ID No. 5621	Seq. ID No. 5622	YES	IM	1
2683a	Seq. ID No. 5623	Seq. ID No. 5624	yes	IM	1
2683b	Seq. ID No. 5625	Seq. ID No. 5626	yes	IM	1
2688a	Seq. ID No. 5633	Seq. ID No. 5634	maybe	IM	2
2688c	Seq. ID No. 5637	Seq. ID No. 5638	maybe	IM	4
2689a	Seq. ID No. 5639	Seq. ID No. 5640	maybe	Peri	0
2689b	Seq. ID No. 5641	Seq. ID No. 5642	YES	Peri	0
2690a	Seq. ID No. 5643	Seq. ID No. 5644	yes	Peri	1
2692b	Seq. ID No. 5649	Seq. ID No. 5650	maybe	IM	1
2696a	Seq. ID No. 5659	Seq. ID No. 5660	yes	IM	8
2710c	Seq. ID No. 5667	Seq. ID No. 5668	maybe	Cyto	
2718a	Seq. ID No. 5681	Seq. ID No. 5682	YES	IM	3
2718b	Seq. ID No. 5683	Seq. ID No. 5684	yes	IM	3
2718c	Seq. ID No. 5685	Seq. ID No. 5686	yes	IM	4
2719a	Seq. ID No. 5687	Seq. ID No. 5688	maybe	Cyto	0
2719b	Seq. ID No. 5689	Seq. ID No. 5690	maybe	Cyto	0
2723	Seq. ID No. 5699	Seq. ID No. 5700	maybe	IM	4
2725a	Seq. ID No. 5703	Seq. ID No. 5704	maybe	Peri	2
2725b	Seq. ID No. 5705	Seq. ID No. 5706	maybe	Cyto	2
2728a	Seq. ID No. 5709	Seq. ID No. 5710	yes	IM	1
2728b	Seq. ID No. 5711	Seq. ID No. 5712	yes	IM	1
2734a	Seq. ID No. 5719	Seq. ID No. 5720	YES	IM	3
2738a	Seq. ID No. 5729	Seq. ID No. 5730	maybe	IM	10
2738c	Seq. ID No. 5733	Seq. ID No. 5734	yes	IM	12
2738d	Seq. ID No. 5735	Seq. ID No. 5736	maybe	IM	12
2742b	Seq. ID No. 5739	Seq. ID No. 5740	yes	Peri	
2749a	Seq. ID No. 5763	Seq. ID No. 5764	NO	IM	3
2749b	Seq. ID No. 5765	Seq. ID No. 5766	yes	IM	4

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
2749c	Seq. ID No. 5767	Seq. ID No. 5768	NO	IM	8
2749e	Seq. ID No. 5771	Seq. ID No. 5772	YES	IM	10
2757b	Seq. ID No. 5783	Seq. ID No. 5784	YES	IM	5
2758a	Seq. ID No. 5785	Seq. ID No. 5786	NO	Cyto	0
2758d	Seq. ID No. 5791	Seq. ID No. 5792	maybe	Cyto	1
2760a	Seq. ID No. 5797	Seq. ID No. 5798	yes	Peri	1
2770	Seq. ID No. 5829	Seq. ID No. 5830	maybe	IM	1
2791	Seq. ID No. 5879	Seq. ID No. 5880	maybe	IM	1
2794	Seq. ID No. 5883	Seq. ID No. 5884	NO	IM	2
2796a	Seq. ID No. 5885	Seq. ID No. 5886	maybe	IM	2
2799a	Seq. ID No. 5889	Seq. ID No. 5890	yes	OM	1
2801a	Seq. ID No. 5893	Seq. ID No. 5894	yes	IM	1
2801b	Seq. ID No. 5895	Seq. ID No. 5896	YES	IM	2
2805a	Seq. ID No. 5899	Seq. ID No. 5900	YES	IM	2
2805b	Seq. ID No. 5901	Seq. ID No. 5902	YES	IM	4
2810a	Seq. ID No. 5905	Seq. ID No. 5906	yes	IM	3
2810c	Seq. ID No. 5909	Seq. ID No. 5910	yes	IM	4
2818a	Seq. ID No. 5921	Seq. ID No. 5922	maybe	IM	2
2818b	Seq. ID No. 5923	Seq. ID No. 5924	yes	IM	5
2818d	Seq. ID No. 5927	Seq. ID No. 5928	YES	IM	6
2818e	Seq. ID No. 5929	Seq. ID No. 5930	YES	IM	6
2822a	Seq. ID No. 5939	Seq. ID No. 5940	YES	IM	3
2869a	Seq. ID No. 6023	Seq. ID No. 6024	maybe	OM	1
2869b	Seq. ID No. 6025	Seq. ID No. 6026	yes	OM	1
2869c	Seq. ID No. 6027	Seq. ID No. 6028	yes	IM	1
2881	Seq. ID No. 6043	Seq. ID No. 6044	yes	IM	1
2883a	Seq. ID No. 6047	Seq. ID No. 6048	yes	IM	6
2883d	Seq. ID No. 6053	Seq. ID No. 6054	yes	IM	8
2887a	Seq. ID No. 6059	Seq. ID No. 6060	yes	Peri	1



TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
2888	Seq. ID No. 6063	Seq. ID No. 6064	maybe	Cyto	1
2891a	Seq. ID No. 6067	Seq. ID No. 6068	NO	Peri	1
2900a	Seq. ID No. 6087	Seq. ID No. 6088	YES	Peri	1
2900b	Seq. ID No. 6089	Seq. ID No. 6090	YES	Peri	1
2901a	Seq. ID No. 6091	Seq. ID No. 6092	YES	IM	1
2902	Seq. ID No. 6095	Seq. ID No. 6096	YES	IM	0
2906	Seq. ID No. 6103	Seq. ID No. 6104	YES	IM	2
2909b	Seq. ID No. 6107	Seq. ID No. 6108	maybe	Cyto	1
2909c	Seq. ID No. 6109	Seq. ID No. 6110	yes	IM	4
2909d	Seq. ID No. 6111	Seq. ID No. 6112	yes	IM	4
2913a	Seq. ID No. 6115	Seq. ID No. 6116	yes	IM	2
2913b	Seq. ID No. 6117	Seq. ID No. 6118	yes	IM	2
2922b	Seq. ID No. 6135	Seq. ID No. 6136	yes	Cyto	0
2923a	Seq. ID No. 6137	Seq. ID No. 6138	yes	Cyto	
2929b	Seq. ID No. 6159	Seq. ID No. 6160	maybe	Cyto	
2931a	Seq. ID No. 6161	Seq. ID No. 6162	yes	IM	5
2931b	Seq. ID No. 6163	Seq. ID No. 6164	NO	IM	6
2931c	Seq. ID No. 6165	Seq. ID No. 6166	yes	IM	13
2933b	Seq. ID No. 6169	Seq. ID No. 6170	YES	IM	1
2941a	Seq. ID No. 6183	Seq. ID No. 6184	yes	IM	2
2941b	Seq. ID No. 6185	Seq. ID No. 6186	YES	IM	5
2941c	Seq. ID No. 6187	Seq. ID No. 6188	YES	IM	5
2943a	Seq. ID No. 6189	Seq. ID No. 6190	yes	IM	3
2943b	Seq. ID No. 6191	Seq. ID No. 6192	yes	IM	5
2944b	Seq. ID No. 6197	Seq. ID No. 6198	YES	IM	1
2948a	Seq. ID No. 6203	Seq. ID No. 6204	YES	IM	1
2948b	Seq. ID No. 6205	Seq. ID No. 6206	YES	IM	5
2948d	Seq. ID No. 6209	Seq. ID No. 6210	yes	IM	7
2952	Seq. ID No. 6217	Seq. ID No. 6218	yes	Cyto	1

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
2955a	Seq. ID No. 6221	Seq. ID No. 6222	YES	IM	4
2955b	Seq. ID No. 6223	Seq. ID No. 6224	YES	IM	4
2955c	Seq. ID No. 6225	Seq. ID No. 6226	yes	IM	6
2955d	Seq. ID No. 6227	Seq. ID No. 6228	maybe	IM	7
2955e	Seq. ID No. 6229	Seq. ID No. 6230	YES	IM	11
2957	Seq. ID No. 6235	Seq. ID No. 6236	yes	IM	4
2958a	Seq. ID No. 6237	Seq. ID No. 6238	maybe	IM	2
2958c	Seq. ID No. 6241	Seq. ID No. 6242	maybe	IM	2
2959	Seq. ID No. 6243	Seq. ID No. 6244	yes	IM	2
2960a	Seq. ID No. 6245	Seq. ID No. 6246	maybe	IM	2
2962b	Seq. ID No. 6249	Seq. ID No. 6250	yes	IM	1
2965a	Seq. ID No. 6253	Seq. ID No. 6254	yes	Cyto	1
2966	Seq. ID No. 6259	Seq. ID No. 6260	yes	IM	1
2969	Seq. ID No. 6263	Seq. ID No. 6264	maybe	IM	1
2970a	Seq. ID No. 6265	Seq. ID No. 6266	yes	IM	1
2970b	Seq. ID No. 6267	Seq. ID No. 6268	yes	IM	1
2974a	Seq. ID No. 6273	Seq. ID No. 6274	maybe	Peri	2
2974b	Seq. ID No. 6275	Seq. ID No. 6276	yes	IM	4
2978a	Seq. ID No. 6283	Seq. ID No. 6284	yes	Peri	1
2978b	Seq. ID No. 6285	Seq. ID No. 6286	yes	Peri	1
2980a	Seq. ID No. 6289	Seq. ID No. 6290	maybe	IM	3
2986a	Seq. ID No. 6301	Seq. ID No. 6302	maybe	IM	6
2986b	Seq. ID No. 6303	Seq. ID No. 6304	yes	IM	7
2993a	Seq. ID No. 6325	Seq. ID No. 6326	yes	OM	0
2993b	Seq. ID No. 6327	Seq. ID No. 6328	yes	OM	0
3016a	Seq. ID No. 6363	Seq. ID No. 6364	yes	IM	4
3016b	Seq. ID No. 6365	Seq. ID No. 6366	yes	IM	7
3021	Seq. ID No. 6377	Seq. ID No. 6378	NO	Peri	1
3023	Seq. ID No. 6381	Seq. ID No. 6382	maybe	IM	1

TABLE 5: SIGNALP: SIGNAL PEPTIDE

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	SignalP	PSORT	MSD
3024a	Seq. ID No. 6383	Seq. ID No. 6384	maybe	Peri	1
3037a	Seq. ID No. 6415	Seq. ID No. 6416	YES	OM	1
3042a	Seq. ID No. 6425	Seq. ID No. 6426	yes	Cyto	1
3042b	Seq. ID No. 6427	Seq. ID No. 6428	yes	Cyto	1
3043a	Seq. ID No. 6429	Seq. ID No. 6430	yes	IM	2
3043b	Seq. ID No. 6431	Seq. ID No. 6432	yes	IM	2
3064b	Seq. ID No. 6473	Seq. ID No. 6474	YES	Peri	1
3066	Seq. ID No. 6479	Seq. ID No. 6480	yes	Cyto	0
3076	Seq. ID No. 6497	Seq. ID No. 6498	maybe	IM	3
3085	Seq. ID No. 6517	Seq. ID No. 6518	maybe	Cyto	0
3096a	Seq. ID No. 6541	Seq. ID No. 6542	yes	IM	1
3096b	Seq. ID No. 6543	Seq. ID No. 6544	YES	IM	1
3100a	Seq. ID No. 6555	Seq. ID No. 6556	maybe	Cyto	0
3100b	Seq. ID No. 6557	Seq. ID No. 6558	maybe	Cyto	0
3107a	Seq. ID No. 6571	Seq. ID No. 6572	yes	OM	1
3107b	Seq. ID No. 6573	Seq. ID No. 6574	yes	OM	2
3110a	Seq. ID No. 6581	Seq. ID No. 6582	NO	IM	1
3119a	Seq. ID No. 6593	Seq. ID No. 6594	NO	IM	3
3119b	Seq. ID No. 6595	Seq. ID No. 6596	YES	IM	4
3119c	Seq. ID No. 6597	Seq. ID No. 6598	YES	IM	4
3119d	Seq. ID No. 6599	Seq. ID No. 6600	YES	IM	4
3119e	Seq. ID No. 6601	Seq. ID No. 6602	YES	IM	4
3119f	Seq. ID No. 6603	Seq. ID No. 6604	YES	IM	4
3140	Seq. ID No. 6631	Seq. ID No. 6632	maybe	IM	2
3145b	Seq. ID No. 6637	Seq. ID No. 6638	maybe	OM	1
3145c	Seq. ID No. 6639	Seq. ID No. 6640	yes	OM	1
3147b	Seq. ID No. 6643	Seq. ID No. 6644	yes	IM	0
3147c	Seq. ID No. 6645	Seq. ID No. 6646	yes	OM	0
3150a	Seq. ID No. 6649	Seq. ID No. 6650	NO	Cyto	0

Listed in Table 6 are 2388 ORFs that meet the criteria of being a non-secretory protein, based on the HMM SignalP program. Of these ORFs, the PSORT program predicted 756 ORFs to be localized to the cytoplasmic inner membrane (IM); 35 ORFs to be localized to the periplasm (Peri); 10 ORFs to be localized to the outer membrane (OM); and 1586 ORFs localized to the cytoplasm. Shown for all ORFs is the number of transmembrane domains predicted by the TopPred2 software (listed in the MSD column).

**TABLE 6: SIGNALP: NON-SECRETORY**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>PSORT</b>	<b>MSD</b>
1	Seq. ID No. 1	Seq. ID No. 2	Cyto	2
2b	Seq. ID No. 5	Seq. ID No. 6	Cyto	3
4c	Seq. ID No. 11	Seq. ID No. 12	IM	12
5	Seq. ID No. 13	Seq. ID No. 14	Cyto	0
7	Seq. ID No. 15	Seq. ID No. 16	Cyto	
10	Seq. ID No. 17	Seq. ID No. 18	Cyto	
16	Seq. ID No. 23	Seq. ID No. 24	IM	0
17	Seq. ID No. 25	Seq. ID No. 26	Cyto	
18	Seq. ID No. 27	Seq. ID No. 28	Cyto	1
20	Seq. ID No. 29	Seq. ID No. 30	IM	1
23b	Seq. ID No. 35	Seq. ID No. 36	IM	1
24	Seq. ID No. 37	Seq. ID No. 38	IM	1
32	Seq. ID No. 39	Seq. ID No. 40	Cyto	
36	Seq. ID No. 41	Seq. ID No. 42	IM	0
37	Seq. ID No. 43	Seq. ID No. 44	Cyto	
39b	Seq. ID No. 51	Seq. ID No. 52	IM	5
41a	Seq. ID No. 55	Seq. ID No. 56	Cyto	
41b	Seq. ID No. 57	Seq. ID No. 58	Cyto	
41c	Seq. ID No. 59	Seq. ID No. 60	IM	1
43b	Seq. ID No. 61	Seq. ID No. 62	Cyto	
43c	Seq. ID No. 63	Seq. ID No. 64	Cyto	
45	Seq. ID No. 69	Seq. ID No. 70	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
46a	Seq. ID No. 71	Seq. ID No. 72	Cyto	
46b	Seq. ID No. 73	Seq. ID No. 74	Cyto	
47	Seq. ID No. 75	Seq. ID No. 76	Cyto	
48a	Seq. ID No. 77	Seq. ID No. 78	IM	0
48b	Seq. ID No. 79	Seq. ID No. 80	IM	0
48c	Seq. ID No. 81	Seq. ID No. 82	IM	0
50	Seq. ID No. 83	Seq. ID No. 84	Cyto	0
51c	Seq. ID No. 89	Seq. ID No. 90	IM	10
55	Seq. ID No. 91	Seq. ID No. 92	IM	1
56b	Seq. ID No. 93	Seq. ID No. 94	Cyto	
57a	Seq. ID No. 95	Seq. ID No. 96	IM	0
57b	Seq. ID No. 97	Seq. ID No. 98	IM	0
58	Seq. ID No. 99	Seq. ID No. 100	Cyto	
60a	Seq. ID No. 101	Seq. ID No. 102	Cyto	
60b	Seq. ID No. 103	Seq. ID No. 104	Cyto	
62a	Seq. ID No. 107	Seq. ID No. 108	Cyto	0
62b	Seq. ID No. 109	Seq. ID No. 110	Cyto	0
63a	Seq. ID No. 113	Seq. ID No. 114	OM	0
63b	Seq. ID No. 115	Seq. ID No. 116	OM	1
65a	Seq. ID No. 117	Seq. ID No. 118	Cyto	
65b	Seq. ID No. 119	Seq. ID No. 120	Cyto	
65c	Seq. ID No. 121	Seq. ID No. 122	Cyto	
67	Seq. ID No. 125	Seq. ID No. 126	Cyto	
69	Seq. ID No. 127	Seq. ID No. 128	Cyto	0
71	Seq. ID No. 129	Seq. ID No. 130	Cyto	0
74	Seq. ID No. 135	Seq. ID No. 136	Cyto	
77	Seq. ID No. 137	Seq. ID No. 138	Cyto	
79	Seq. ID No. 139	Seq. ID No. 140	IM	2
80b	Seq. ID No. 143	Seq. ID No. 144	IM	4

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
80c	Seq. ID No. 145	Seq. ID No. 146	IM	5
81a	Seq. ID No. 147	Seq. ID No. 148	Cyto	
81b	Seq. ID No. 149	Seq. ID No. 150	Cyto	
83	Seq. ID No. 151	Seq. ID No. 152	IM	2
85a	Seq. ID No. 153	Seq. ID No. 154	Cyto	
85b	Seq. ID No. 155	Seq. ID No. 156	Cyto	
85c	Seq. ID No. 157	Seq. ID No. 158	Cyto	
87c	Seq. ID No. 165	Seq. ID No. 166	IM	2
88	Seq. ID No. 167	Seq. ID No. 168	IM	5
89	Seq. ID No. 169	Seq. ID No. 170	IM	2
91b	Seq. ID No. 173	Seq. ID No. 174	IM	0
91c	Seq. ID No. 175	Seq. ID No. 176	IM	0
91d	Seq. ID No. 177	Seq. ID No. 178	IM	0
93a	Seq. ID No. 179	Seq. ID No. 180	Cyto	1
93b	Seq. ID No. 181	Seq. ID No. 182	Peri	1
93c	Seq. ID No. 183	Seq. ID No. 184	Peri	2
94	Seq. ID No. 185	Seq. ID No. 186	IM	2
95b	Seq. ID No. 187	Seq. ID No. 188	Cyto	
97b	Seq. ID No. 189	Seq. ID No. 190	Cyto	
101	Seq. ID No. 193	Seq. ID No. 194	IM	1
102	Seq. ID No. 195	Seq. ID No. 196	Cyto	0
104a	Seq. ID No. 197	Seq. ID No. 198	Cyto	
104b	Seq. ID No. 199	Seq. ID No. 200	Cyto	
104c	Seq. ID No. 201	Seq. ID No. 202	Peri	1
105a	Seq. ID No. 203	Seq. ID No. 204	IM	
105b	Seq. ID No. 205	Seq. ID No. 206	IM	
106	Seq. ID No. 207	Seq. ID No. 208	Cyto	0
111b	Seq. ID No. 219	Seq. ID No. 220	IM	8
112a	Seq. ID No. 221	Seq. ID No. 222	Cyto	0

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
112b	Seq. ID No. 223	Seq. ID No. 224	Cyto	0
115	Seq. ID No. 227	Seq. ID No. 228	Cyto	
119a	Seq. ID No. 229	Seq. ID No. 230	IM	2
119b	Seq. ID No. 231	Seq. ID No. 232	IM	3
121	Seq. ID No. 233	Seq. ID No. 234	Cyto	0
124c	Seq. ID No. 239	Seq. ID No. 240	IM	5
125	Seq. ID No. 241	Seq. ID No. 242	Cyto	
127a	Seq. ID No. 243	Seq. ID No. 244	Cyto	
127b	Seq. ID No. 245	Seq. ID No. 246	Cyto	
127c	Seq. ID No. 247	Seq. ID No. 248	IM	
129c	Seq. ID No. 253	Seq. ID No. 254	IM	10
134	Seq. ID No. 261	Seq. ID No. 262	Cyto	1
135a	Seq. ID No. 263	Seq. ID No. 264	Cyto	
135b	Seq. ID No. 265	Seq. ID No. 266	Cyto	
137a	Seq. ID No. 267	Seq. ID No. 268	Cyto	
137b	Seq. ID No. 269	Seq. ID No. 270	Cyto	
142	Seq. ID No. 275	Seq. ID No. 276	Cyto	
144a	Seq. ID No. 279	Seq. ID No. 280	Peri	0
144b	Seq. ID No. 281	Seq. ID No. 282	Peri	0
144c	Seq. ID No. 283	Seq. ID No. 284	Cyto	0
145d	Seq. ID No. 291	Seq. ID No. 292	IM	12
147	Seq. ID No. 293	Seq. ID No. 294	Cyto	
151a	Seq. ID No. 295	Seq. ID No. 296	IM	1
151b	Seq. ID No. 297	Seq. ID No. 298	IM	1
152a	Seq. ID No. 299	Seq. ID No. 300	Cyto	0
152b	Seq. ID No. 301	Seq. ID No. 302	Cyto	0
153a	Seq. ID No. 303	Seq. ID No. 304	Cyto	
153b	Seq. ID No. 305	Seq. ID No. 306	Cyto	
153c	Seq. ID No. 307	Seq. ID No. 308	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
154	Seq. ID No. 309	Seq. ID No. 310	Cyto	0
155a	Seq. ID No. 311	Seq. ID No. 312	Cyto	
155b	Seq. ID No. 313	Seq. ID No. 314	Cyto	
157a	Seq. ID No. 315	Seq. ID No. 316	Cyto	
157b	Seq. ID No. 317	Seq. ID No. 318	Cyto	
158a	Seq. ID No. 319	Seq. ID No. 320	Cyto	
158b	Seq. ID No. 321	Seq. ID No. 322	Cyto	
160a	Seq. ID No. 323	Seq. ID No. 324	Cyto	
160b	Seq. ID No. 325	Seq. ID No. 326	Cyto	
162c	Seq. ID No. 331	Seq. ID No. 332	IM	5
162d	Seq. ID No. 333	Seq. ID No. 334	IM	5
162e	Seq. ID No. 335	Seq. ID No. 336	IM	5
163	Seq. ID No. 337	Seq. ID No. 338	Cyto	0
164	Seq. ID No. 339	Seq. ID No. 340	Cyto	
165a	Seq. ID No. 341	Seq. ID No. 342	IM	
165b	Seq. ID No. 343	Seq. ID No. 344	IM	
167	Seq. ID No. 345	Seq. ID No. 346	IM	
169	Seq. ID No. 347	Seq. ID No. 348	IM	2
170	Seq. ID No. 349	Seq. ID No. 350	IM	1
171a	Seq. ID No. 351	Seq. ID No. 352	Cyto	
171b	Seq. ID No. 353	Seq. ID No. 354	Cyto	
172	Seq. ID No. 355	Seq. ID No. 356	Cyto	
175	Seq. ID No. 361	Seq. ID No. 362	Cyto	
176	Seq. ID No. 363	Seq. ID No. 364	Cyto	
177a	Seq. ID No. 365	Seq. ID No. 366	IM	
177b	Seq. ID No. 367	Seq. ID No. 368	IM	
179a	Seq. ID No. 369	Seq. ID No. 370	IM	2
179b	Seq. ID No. 371	Seq. ID No. 372	IM	2
183a	Seq. ID No. 377	Seq. ID No. 378	IM	1



TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
184	Seq. ID No. 379	Seq. ID No. 380	Cyto	
185	Seq. ID No. 381	Seq. ID No. 382	Cyto	
186	Seq. ID No. 383	Seq. ID No. 384	Cyto	
187a	Seq. ID No. 385	Seq. ID No. 386	IM	1
187b	Seq. ID No. 387	Seq. ID No. 388	IM	1
188	Seq. ID No. 389	Seq. ID No. 390	Cyto	
189b	Seq. ID No. 391	Seq. ID No. 392	Cyto	
192a	Seq. ID No. 395	Seq. ID No. 396	Cyto	0
192b	Seq. ID No. 397	Seq. ID No. 398	Cyto	0
193	Seq. ID No. 399	Seq. ID No. 400	Cyto	
195	Seq. ID No. 405	Seq. ID No. 406	Cyto	
196	Seq. ID No. 407	Seq. ID No. 408	Cyto	1
197a	Seq. ID No. 409	Seq. ID No. 410	Cyto	
197b	Seq. ID No. 411	Seq. ID No. 412	Cyto	
198a	Seq. ID No. 413	Seq. ID No. 414	Peri	
198b	Seq. ID No. 415	Seq. ID No. 416	Peri	
200	Seq. ID No. 417	Seq. ID No. 418	Cyto	
201a	Seq. ID No. 419	Seq. ID No. 420	IM	2
202	Seq. ID No. 421	Seq. ID No. 422	Cyto	
203	Seq. ID No. 423	Seq. ID No. 424	Cyto	
204	Seq. ID No. 425	Seq. ID No. 426	Cyto	
205	Seq. ID No. 427	Seq. ID No. 428	Cyto	
206	Seq. ID No. 429	Seq. ID No. 430	Cyto	
207	Seq. ID No. 431	Seq. ID No. 432	IM	0
208a	Seq. ID No. 433	Seq. ID No. 434	Cyto	
208b	Seq. ID No. 435	Seq. ID No. 436	Cyto	
210	Seq. ID No. 437	Seq. ID No. 438	Cyto	
211	Seq. ID No. 439	Seq. ID No. 440	Cyto	
213	Seq. ID No. 441	Seq. ID No. 442	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
215a	Seq. ID No. 443	Seq. ID No. 444	Cyto	
218	Seq. ID No. 445	Seq. ID No. 446	Cyto	
219	Seq. ID No. 447	Seq. ID No. 448	Cyto	0
220a	Seq. ID No. 449	Seq. ID No. 450	Cyto	0
220b	Seq. ID No. 451	Seq. ID No. 452	Cyto	0
220c	Seq. ID No. 453	Seq. ID No. 454	Cyto	0
226a	Seq. ID No. 459	Seq. ID No. 460	Cyto	
226b	Seq. ID No. 461	Seq. ID No. 462	Cyto	
227	Seq. ID No. 463	Seq. ID No. 464	Cyto	
228a	Seq. ID No. 465	Seq. ID No. 466	Cyto	
228b	Seq. ID No. 467	Seq. ID No. 468	Cyto	
228c	Seq. ID No. 469	Seq. ID No. 470	Cyto	
228d	Seq. ID No. 471	Seq. ID No. 472	Cyto	
232a	Seq. ID No. 473	Seq. ID No. 474	IM	0
232b	Seq. ID No. 475	Seq. ID No. 476	IM	0
235b	Seq. ID No. 479	Seq. ID No. 480	Cyto	1
236a	Seq. ID No. 481	Seq. ID No. 482	Cyto	
236b	Seq. ID No. 483	Seq. ID No. 484	Cyto	
236c	Seq. ID No. 485	Seq. ID No. 486	Cyto	
245c	Seq. ID No. 501	Seq. ID No. 502	IM	10
247	Seq. ID No. 507	Seq. ID No. 508	IM	3
251	Seq. ID No. 517	Seq. ID No. 518	IM	1
253a	Seq. ID No. 519	Seq. ID No. 520	IM	
253b	Seq. ID No. 521	Seq. ID No. 522	Cyto	
254	Seq. ID No. 523	Seq. ID No. 524	IM	1
255c	Seq. ID No. 529	Seq. ID No. 530	IM	12
255d	Seq. ID No. 531	Seq. ID No. 532	IM	12
258	Seq. ID No. 533	Seq. ID No. 534	Cyto	
259a	Seq. ID No. 535	Seq. ID No. 536	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
259b	Seq. ID No. 537	Seq. ID No. 538	Cyto	
259c	Seq. ID No. 539	Seq. ID No. 540	Cyto	
260	Seq. ID No. 541	Seq. ID No. 542	Cyto	
262	Seq. ID No. 543	Seq. ID No. 544	Cyto	
265	Seq. ID No. 551	Seq. ID No. 552	Cyto	
267b	Seq. ID No. 553	Seq. ID No. 554	Cyto	0
267c	Seq. ID No. 555	Seq. ID No. 556	Cyto	0
269a	Seq. ID No. 559	Seq. ID No. 560	Cyto	
269b	Seq. ID No. 561	Seq. ID No. 562	IM	0
271a	Seq. ID No. 563	Seq. ID No. 564	Cyto	
271b	Seq. ID No. 565	Seq. ID No. 566	Cyto	
277a	Seq. ID No. 571	Seq. ID No. 572	Cyto	
277b	Seq. ID No. 573	Seq. ID No. 574	IM	
280a	Seq. ID No. 581	Seq. ID No. 582	Cyto	1
280b	Seq. ID No. 583	Seq. ID No. 584	Cyto	1
280c	Seq. ID No. 585	Seq. ID No. 586	Cyto	1
280d	Seq. ID No. 587	Seq. ID No. 588	Cyto	1
282	Seq. ID No. 589	Seq. ID No. 590	Cyto	
284a	Seq. ID No. 595	Seq. ID No. 596	IM	5
284b	Seq. ID No. 597	Seq. ID No. 598	IM	5
286a	Seq. ID No. 601	Seq. ID No. 602	Cyto	
286b	Seq. ID No. 603	Seq. ID No. 604	Cyto	
287	Seq. ID No. 605	Seq. ID No. 606	Cyto	
290a	Seq. ID No. 607	Seq. ID No. 608	Cyto	
290b	Seq. ID No. 609	Seq. ID No. 610	IM	
293	Seq. ID No. 611	Seq. ID No. 612	Cyto	
294	Seq. ID No. 613	Seq. ID No. 614	Cyto	0
296	Seq. ID No. 615	Seq. ID No. 616	Cyto	0
300b	Seq. ID No. 619	Seq. ID No. 620	IM	0

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
301a	Seq. ID No. 621	Seq. ID No. 622	Cyto	1
301b	Seq. ID No. 623	Seq. ID No. 624	Cyto	1
304a	Seq. ID No. 625	Seq. ID No. 626	Cyto	1
304b	Seq. ID No. 627	Seq. ID No. 628	Cyto	1
307	Seq. ID No. 629	Seq. ID No. 630	Cyto	
308	Seq. ID No. 631	Seq. ID No. 632	Cyto	0
309	Seq. ID No. 633	Seq. ID No. 634	IM	0
310	Seq. ID No. 635	Seq. ID No. 636	Cyto	0
315	Seq. ID No. 649	Seq. ID No. 650	Cyto	
316a	Seq. ID No. 651	Seq. ID No. 652	IM	3
318d	Seq. ID No. 663	Seq. ID No. 664	IM	2
318e	Seq. ID No. 665	Seq. ID No. 666	IM	2
323a	Seq. ID No. 671	Seq. ID No. 672	Cyto	
323b	Seq. ID No. 673	Seq. ID No. 674	Cyto	
327c	Seq. ID No. 681	Seq. ID No. 682	IM	5
329	Seq. ID No. 683	Seq. ID No. 684	Cyto	
330a	Seq. ID No. 685	Seq. ID No. 686	Cyto	0
330b	Seq. ID No. 687	Seq. ID No. 688	Cyto	0
330c	Seq. ID No. 689	Seq. ID No. 690	Cyto	0
331	Seq. ID No. 691	Seq. ID No. 692	Cyto	
332	Seq. ID No. 693	Seq. ID No. 694	Cyto	
333	Seq. ID No. 695	Seq. ID No. 696	Cyto	1
334	Seq. ID No. 697	Seq. ID No. 698	Cyto	
335a	Seq. ID No. 699	Seq. ID No. 700	IM	5
335b	Seq. ID No. 701	Seq. ID No. 702	IM	5
337	Seq. ID No. 703	Seq. ID No. 704	Cyto	
338a	Seq. ID No. 705	Seq. ID No. 706	Cyto	
338b	Seq. ID No. 707	Seq. ID No. 708	Cyto	
338c	Seq. ID No. 709	Seq. ID No. 710	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
341a	Seq. ID No. 711	Seq. ID No. 712	Cyto	0
341b	Seq. ID No. 713	Seq. ID No. 714	Cyto	0
342g	Seq. ID No. 727	Seq. ID No. 728	IM	12
342h	Seq. ID No. 729	Seq. ID No. 730	IM	12
344a	Seq. ID No. 731	Seq. ID No. 732	IM	1
344b	Seq. ID No. 733	Seq. ID No. 734	IM	1
345	Seq. ID No. 735	Seq. ID No. 736	Cyto	
346a	Seq. ID No. 737	Seq. ID No. 738	Cyto	
346b	Seq. ID No. 739	Seq. ID No. 740	Cyto	0
347	Seq. ID No. 741	Seq. ID No. 742	Cyto	
349a	Seq. ID No. 743	Seq. ID No. 744	Cyto	
351	Seq. ID No. 753	Seq. ID No. 754	Cyto	1
355	Seq. ID No. 767	Seq. ID No. 768	Cyto	0
356b	Seq. ID No. 771	Seq. ID No. 772	IM	4
356c	Seq. ID No. 773	Seq. ID No. 774	IM	4
356d	Seq. ID No. 775	Seq. ID No. 776	IM	5
362	Seq. ID No. 783	Seq. ID No. 784	IM	2
365a	Seq. ID No. 785	Seq. ID No. 786	Cyto	
365b	Seq. ID No. 787	Seq. ID No. 788	Cyto	
366b	Seq. ID No. 789	Seq. ID No. 790	Cyto	
366c	Seq. ID No. 791	Seq. ID No. 792	Cyto	
367a	Seq. ID No. 793	Seq. ID No. 794	Cyto	1
367b	Seq. ID No. 795	Seq. ID No. 796	Cyto	1
371a	Seq. ID No. 797	Seq. ID No. 798	Cyto	
371b	Seq. ID No. 799	Seq. ID No. 800	Cyto	
372a	Seq. ID No. 801	Seq. ID No. 802	Cyto	
372b	Seq. ID No. 803	Seq. ID No. 804	Cyto	
372c	Seq. ID No. 805	Seq. ID No. 806	OM	
377a	Seq. ID No. 811	Seq. ID No. 812	Cyto	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
377b	Seq. ID No. 813	Seq. ID No. 814	Cyto	1
378a	Seq. ID No. 815	Seq. ID No. 816	IM	1
378b	Seq. ID No. 817	Seq. ID No. 818	IM	1
383a	Seq. ID No. 821	Seq. ID No. 822	Cyto	
383b	Seq. ID No. 823	Seq. ID No. 824	Cyto	1
384b	Seq. ID No. 827	Seq. ID No. 828	IM	10
385a	Seq. ID No. 829	Seq. ID No. 830	IM	0
385b	Seq. ID No. 831	Seq. ID No. 832	IM	0
386	Seq. ID No. 833	Seq. ID No. 834	Cyto	
387	Seq. ID No. 835	Seq. ID No. 836	Cyto	
390	Seq. ID No. 837	Seq. ID No. 838	IM	
391	Seq. ID No. 839	Seq. ID No. 840	Peri	
393b	Seq. ID No. 841	Seq. ID No. 842	Cyto	
395a	Seq. ID No. 843	Seq. ID No. 844	IM	6
395b	Seq. ID No. 845	Seq. ID No. 846	IM	6
395c	Seq. ID No. 847	Seq. ID No. 848	IM	6
396	Seq. ID No. 849	Seq. ID No. 850	Peri	2
398	Seq. ID No. 851	Seq. ID No. 852	IM	2
400a	Seq. ID No. 853	Seq. ID No. 854	IM	0
400b	Seq. ID No. 855	Seq. ID No. 856	IM	0
401a	Seq. ID No. 857	Seq. ID No. 858	Cyto	
401b	Seq. ID No. 859	Seq. ID No. 860	Cyto	
403a	Seq. ID No. 861	Seq. ID No. 862	Cyto	1
403c	Seq. ID No. 865	Seq. ID No. 866	Cyto	2
403d	Seq. ID No. 867	Seq. ID No. 868	Cyto	2
406a	Seq. ID No. 869	Seq. ID No. 870	Cyto	
406b	Seq. ID No. 871	Seq. ID No. 872	Cyto	
409a	Seq. ID No. 873	Seq. ID No. 874	Cyto	0
409b	Seq. ID No. 875	Seq. ID No. 876	Cyto	0

**TABLE 6: SIGNALP: NON-SECRETORY**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>PSORT</b>	<b>MSD</b>
410a	Seq. ID No. 877	Seq. ID No. 878	Cyto	0
410b	Seq. ID No. 879	Seq. ID No. 880	IM	1
410c	Seq. ID No. 881	Seq. ID No. 882	IM	1
413a	Seq. ID No. 883	Seq. ID No. 884	Cyto	
413b	Seq. ID No. 885	Seq. ID No. 886	Cyto	
416a	Seq. ID No. 887	Seq. ID No. 888	Cyto	
416b	Seq. ID No. 889	Seq. ID No. 890	Cyto	
417	Seq. ID No. 891	Seq. ID No. 892	Cyto	
418b	Seq. ID No. 895	Seq. ID No. 896	IM	7
419a	Seq. ID No. 897	Seq. ID No. 898	IM	1
419b	Seq. ID No. 899	Seq. ID No. 900	IM	1
420a	Seq. ID No. 903	Seq. ID No. 904	IM	1
420b	Seq. ID No. 905	Seq. ID No. 906	IM	1
421	Seq. ID No. 907	Seq. ID No. 908	IM	1
422	Seq. ID No. 909	Seq. ID No. 910	Cyto	
424a	Seq. ID No. 911	Seq. ID No. 912	Cyto	0
424b	Seq. ID No. 913	Seq. ID No. 914	IM	1
424c	Seq. ID No. 915	Seq. ID No. 916	IM	1
426a	Seq. ID No. 917	Seq. ID No. 918	Cyto	
426b	Seq. ID No. 919	Seq. ID No. 920	Cyto	
427a	Seq. ID No. 921	Seq. ID No. 922	Cyto	
427b	Seq. ID No. 923	Seq. ID No. 924	Cyto	
427c	Seq. ID No. 925	Seq. ID No. 926	Cyto	
429a	Seq. ID No. 927	Seq. ID No. 928	Cyto	
429b	Seq. ID No. 929	Seq. ID No. 930	OM	0
429c	Seq. ID No. 931	Seq. ID No. 932	Cyto	0
429d	Seq. ID No. 933	Seq. ID No. 934	Cyto	0
435	Seq. ID No. 939	Seq. ID No. 940	Cyto	
438a	Seq. ID No. 945	Seq. ID No. 946	IM	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
438b	Seq. ID No. 947	Seq. ID No. 948	IM	1
438c	Seq. ID No. 949	Seq. ID No. 950	IM	1
440	Seq. ID No. 951	Seq. ID No. 952	IM	2
441a	Seq. ID No. 953	Seq. ID No. 954	IM	1
444a	Seq. ID No. 959	Seq. ID No. 960	Cyto	
444b	Seq. ID No. 961	Seq. ID No. 962	Cyto	
445a	Seq. ID No. 963	Seq. ID No. 964	Cyto	0
445b	Seq. ID No. 965	Seq. ID No. 966	Cyto	0
450a	Seq. ID No. 969	Seq. ID No. 970	Cyto	0
450b	Seq. ID No. 971	Seq. ID No. 972	Cyto	0
451a	Seq. ID No. 973	Seq. ID No. 974	Peri	
451b	Seq. ID No. 975	Seq. ID No. 976	Peri	
452a	Seq. ID No. 977	Seq. ID No. 978	IM	4
454b	Seq. ID No. 987	Seq. ID No. 988	Cyto	
455a	Seq. ID No. 989	Seq. ID No. 990	IM	0
455b	Seq. ID No. 991	Seq. ID No. 992	IM	0
455c	Seq. ID No. 993	Seq. ID No. 994	IM	0
458a	Seq. ID No. 995	Seq. ID No. 996	Cyto	
458b	Seq. ID No. 997	Seq. ID No. 998	Cyto	
460a	Seq. ID No. 999	Seq. ID No. 1000	Cyto	1
464d	Seq. ID No. 1017	Seq. ID No. 1018	IM	13
467a	Seq. ID No. 1021	Seq. ID No. 1022	Cyto	0
467b	Seq. ID No. 1023	Seq. ID No. 1024	Cyto	0
471a	Seq. ID No. 1025	Seq. ID No. 1026	Cyto	1
471b	Seq. ID No. 1027	Seq. ID No. 1028	Cyto	1
473	Seq. ID No. 1041	Seq. ID No. 1042	IM	2
474	Seq. ID No. 1043	Seq. ID No. 1044	Cyto	0
477b	Seq. ID No. 1047	Seq. ID No. 1048	Cyto	0
478a	Seq. ID No. 1049	Seq. ID No. 1050	IM	1



TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
478b	Seq. ID No. 1051	Seq. ID No. 1052	IM	1
479	Seq. ID No. 1053	Seq. ID No. 1054	Cyto	
480b	Seq. ID No. 1057	Seq. ID No. 1058	Cyto	1
481a	Seq. ID No. 1059	Seq. ID No. 1060	Cyto	
481b	Seq. ID No. 1061	Seq. ID No. 1062	Cyto	
482a	Seq. ID No. 1063	Seq. ID No. 1064	Cyto	
482b	Seq. ID No. 1065	Seq. ID No. 1066	Cyto	
483	Seq. ID No. 1067	Seq. ID No. 1068	Cyto	
490	Seq. ID No. 1069	Seq. ID No. 1070	Cyto	
491a	Seq. ID No. 1071	Seq. ID No. 1072	Cyto	
491b	Seq. ID No. 1073	Seq. ID No. 1074	Cyto	
495a	Seq. ID No. 1079	Seq. ID No. 1080	Cyto	0
495b	Seq. ID No. 1081	Seq. ID No. 1082	Cyto	0
495c	Seq. ID No. 1083	Seq. ID No. 1084	IM	0
498a	Seq. ID No. 1085	Seq. ID No. 1086	Cyto	
498b	Seq. ID No. 1087	Seq. ID No. 1088	Cyto	
499a	Seq. ID No. 1089	Seq. ID No. 1090	IM	2
499b	Seq. ID No. 1091	Seq. ID No. 1092	IM	2
500	Seq. ID No. 1093	Seq. ID No. 1094	Cyto	
502b	Seq. ID No. 1095	Seq. ID No. 1096	Cyto	
502c	Seq. ID No. 1097	Seq. ID No. 1098	Cyto	
504	Seq. ID No. 1099	Seq. ID No. 1100	Cyto	
505a	Seq. ID No. 1101	Seq. ID No. 1102	Cyto	1
505b	Seq. ID No. 1103	Seq. ID No. 1104	Cyto	1
509	Seq. ID No. 1109	Seq. ID No. 1110	Cyto	
510	Seq. ID No. 1111	Seq. ID No. 1112	Cyto	
512a	Seq. ID No. 1113	Seq. ID No. 1114	Cyto	
512b	Seq. ID No. 1115	Seq. ID No. 1116	Cyto	
514	Seq. ID No. 1117	Seq. ID No. 1118	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
515a	Seq. ID No. 1119	Seq. ID No. 1120	Cyto	
515b	Seq. ID No. 1121	Seq. ID No. 1122	IM	
515c	Seq. ID No. 1123	Seq. ID No. 1124	Cyto	
518a	Seq. ID No. 1125	Seq. ID No. 1126	Cyto	0
518b	Seq. ID No. 1127	Seq. ID No. 1128	Cyto	0
518c	Seq. ID No. 1129	Seq. ID No. 1130	Cyto	0
523	Seq. ID No. 1133	Seq. ID No. 1134	Cyto	
527a	Seq. ID No. 1141	Seq. ID No. 1142	Cyto	
527b	Seq. ID No. 1143	Seq. ID No. 1144	Cyto	
528a	Seq. ID No. 1145	Seq. ID No. 1146	IM	1
528b	Seq. ID No. 1147	Seq. ID No. 1148	IM	1
529	Seq. ID No. 1149	Seq. ID No. 1150	Cyto	0
530b	Seq. ID No. 1153	Seq. ID No. 1154	Peri	
533	Seq. ID No. 1155	Seq. ID No. 1156	IM	9
535	Seq. ID No. 1157	Seq. ID No. 1158	Cyto	
536	Seq. ID No. 1159	Seq. ID No. 1160	Cyto	1
539b	Seq. ID No. 1161	Seq. ID No. 1162	Cyto	
539c	Seq. ID No. 1163	Seq. ID No. 1164	Cyto	
541d	Seq. ID No. 1171	Seq. ID No. 1172	IM	5
543a	Seq. ID No. 1175	Seq. ID No. 1176	Cyto	
543b	Seq. ID No. 1177	Seq. ID No. 1178	Cyto	
543c	Seq. ID No. 1179	Seq. ID No. 1180	Cyto	
544	Seq. ID No. 1181	Seq. ID No. 1182	IM	4
545b	Seq. ID No. 1185	Seq. ID No. 1186	IM	3
545c	Seq. ID No. 1187	Seq. ID No. 1188	IM	4
546a	Seq. ID No. 1189	Seq. ID No. 1190	Cyto	
546b	Seq. ID No. 1191	Seq. ID No. 1192	IM	1
546c	Seq. ID No. 1193	Seq. ID No. 1194	IM	1
548	Seq. ID No. 1199	Seq. ID No. 1200	IM	2

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
549b	Seq. ID No. 1201	Seq. ID No. 1202	IM	2
551	Seq. ID No. 1205	Seq. ID No. 1206	IM	1
553c	Seq. ID No. 1207	Seq. ID No. 1208	IM	1
554a	Seq. ID No. 1209	Seq. ID No. 1210	Cyto	1
554b	Seq. ID No. 1211	Seq. ID No. 1212	Cyto	1
557a	Seq. ID No. 1215	Seq. ID No. 1216	Cyto	0
557b	Seq. ID No. 1217	Seq. ID No. 1218	Cyto	0
560a	Seq. ID No. 1219	Seq. ID No. 1220	IM	0
560b	Seq. ID No. 1221	Seq. ID No. 1222	IM	0
563	Seq. ID No. 1225	Seq. ID No. 1226	IM	0
564c	Seq. ID No. 1231	Seq. ID No. 1232	IM	5
569	Seq. ID No. 1233	Seq. ID No. 1234	Cyto	
570a	Seq. ID No. 1235	Seq. ID No. 1236	IM	1
571	Seq. ID No. 1239	Seq. ID No. 1240	Peri	0
573	Seq. ID No. 1241	Seq. ID No. 1242	IM	5
578a	Seq. ID No. 1247	Seq. ID No. 1248	Cyto	0
578b	Seq. ID No. 1249	Seq. ID No. 1250	Cyto	0
580a	Seq. ID No. 1251	Seq. ID No. 1252	Cyto	
580b	Seq. ID No. 1253	Seq. ID No. 1254	Cyto	
583a	Seq. ID No. 1255	Seq. ID No. 1256	IM	0
583b	Seq. ID No. 1257	Seq. ID No. 1258	IM	0
586a	Seq. ID No. 1261	Seq. ID No. 1262	IM	2
586b	Seq. ID No. 1263	Seq. ID No. 1264	IM	2
588a	Seq. ID No. 1273	Seq. ID No. 1274	Cyto	1
588b	Seq. ID No. 1275	Seq. ID No. 1276	Cyto	1
589a	Seq. ID No. 1277	Seq. ID No. 1278	Cyto	1
589b	Seq. ID No. 1279	Seq. ID No. 1280	Cyto	1
590	Seq. ID No. 1281	Seq. ID No. 1282	IM	2
595b	Seq. ID No. 1285	Seq. ID No. 1286	IM	2

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
597	Seq. ID No. 1293	Seq. ID No. 1294	IM	3
599a	Seq. ID No. 1299	Seq. ID No. 1300	IM	2
599b	Seq. ID No. 1301	Seq. ID No. 1302	IM	2
603a	Seq. ID No. 1307	Seq. ID No. 1308	Cyto	1
606	Seq. ID No. 1309	Seq. ID No. 1310	Cyto	
607a	Seq. ID No. 1311	Seq. ID No. 1312	IM	0
607b	Seq. ID No. 1313	Seq. ID No. 1314	IM	0
610b	Seq. ID No. 1321	Seq. ID No. 1322	IM	1
611	Seq. ID No. 1323	Seq. ID No. 1324	Peri	0
614a	Seq. ID No. 1333	Seq. ID No. 1334	Cyto	
614b	Seq. ID No. 1335	Seq. ID No. 1336	Cyto	
618	Seq. ID No. 1339	Seq. ID No. 1340	IM	4
620	Seq. ID No. 1345	Seq. ID No. 1346	Cyto	
625	Seq. ID No. 1355	Seq. ID No. 1356	Cyto	
626a	Seq. ID No. 1357	Seq. ID No. 1358	Cyto	0
626b	Seq. ID No. 1359	Seq. ID No. 1360	Cyto	0
626c	Seq. ID No. 1361	Seq. ID No. 1362	Cyto	0
631a	Seq. ID No. 1363	Seq. ID No. 1364	IM	1
633a	Seq. ID No. 1373	Seq. ID No. 1374	IM	0
633b	Seq. ID No. 1375	Seq. ID No. 1376	IM	0
633c	Seq. ID No. 1377	Seq. ID No. 1378	Cyto	0
634b	Seq. ID No. 1379	Seq. ID No. 1380	Cyto	
637a	Seq. ID No. 1383	Seq. ID No. 1384	IM	0
637b	Seq. ID No. 1385	Seq. ID No. 1386	IM	0
637c	Seq. ID No. 1387	Seq. ID No. 1388	IM	0
640	Seq. ID No. 1389	Seq. ID No. 1390	Cyto	0
641a	Seq. ID No. 1391	Seq. ID No. 1392	IM	1
641b	Seq. ID No. 1393	Seq. ID No. 1394	IM	1
643	Seq. ID No. 1395	Seq. ID No. 1396	IM	1

**TABLE 6: SIGNALP: NON-SECRETORY**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>PSORT</b>	<b>MSD</b>
644a	Seq. ID No. 1397	Seq. ID No. 1398	Cyto	
644b	Seq. ID No. 1399	Seq. ID No. 1400	Cyto	
650	Seq. ID No. 1403	Seq. ID No. 1404	Cyto	
652	Seq. ID No. 1405	Seq. ID No. 1406	Cyto	
653a	Seq. ID No. 1407	Seq. ID No. 1408	Cyto	1
653b	Seq. ID No. 1409	Seq. ID No. 1410	Cyto	1
653c	Seq. ID No. 1411	Seq. ID No. 1412	Cyto	1
656	Seq. ID No. 1413	Seq. ID No. 1414	Cyto	0
657c	Seq. ID No. 1415	Seq. ID No. 1416	Cyto	
658a	Seq. ID No. 1417	Seq. ID No. 1418	IM	4
658b	Seq. ID No. 1419	Seq. ID No. 1420	IM	4
659a	Seq. ID No. 1421	Seq. ID No. 1422	Cyto	
659b	Seq. ID No. 1423	Seq. ID No. 1424	Cyto	
661	Seq. ID No. 1425	Seq. ID No. 1426	Cyto	
663	Seq. ID No. 1427	Seq. ID No. 1428	Cyto	0
666	Seq. ID No. 1431	Seq. ID No. 1432	IM	4
670	Seq. ID No. 1433	Seq. ID No. 1434	Cyto	1
674b	Seq. ID No. 1437	Seq. ID No. 1438	IM	1
676	Seq. ID No. 1439	Seq. ID No. 1440	Cyto	
677a	Seq. ID No. 1441	Seq. ID No. 1442	Cyto	0
677b	Seq. ID No. 1443	Seq. ID No. 1444	Cyto	0
680	Seq. ID No. 1449	Seq. ID No. 1450	Cyto	0
681	Seq. ID No. 1451	Seq. ID No. 1452	Cyto	0
683a	Seq. ID No. 1453	Seq. ID No. 1454	Cyto	
683b	Seq. ID No. 1455	Seq. ID No. 1456	Cyto	
684	Seq. ID No. 1457	Seq. ID No. 1458	Cyto	
687	Seq. ID No. 1459	Seq. ID No. 1460	Peri	
688a	Seq. ID No. 1461	Seq. ID No. 1462	IM	4
688b	Seq. ID No. 1463	Seq. ID No. 1464	IM	4

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
690	Seq. ID No. 1465	Seq. ID No. 1466	Cyto	
691a	Seq. ID No. 1467	Seq. ID No. 1468	Cyto	
691b	Seq. ID No. 1469	Seq. ID No. 1470	Cyto	
692	Seq. ID No. 1471	Seq. ID No. 1472	IM	0
694	Seq. ID No. 1473	Seq. ID No. 1474	Cyto	
696	Seq. ID No. 1475	Seq. ID No. 1476	Cyto	
698	Seq. ID No. 1477	Seq. ID No. 1478	IM	4
699b	Seq. ID No. 1479	Seq. ID No. 1480	IM	1
700b	Seq. ID No. 1483	Seq. ID No. 1484	IM	7
700c	Seq. ID No. 1485	Seq. ID No. 1486	IM	7
703	Seq. ID No. 1487	Seq. ID No. 1488	IM	0
705a	Seq. ID No. 1489	Seq. ID No. 1490	Cyto	0
705b	Seq. ID No. 1491	Seq. ID No. 1492	Cyto	0
707	Seq. ID No. 1493	Seq. ID No. 1494	Cyto	
709	Seq. ID No. 1495	Seq. ID No. 1496	Cyto	
710	Seq. ID No. 1497	Seq. ID No. 1498	Cyto	
712a	Seq. ID No. 1499	Seq. ID No. 1500	Cyto	
712b	Seq. ID No. 1501	Seq. ID No. 1502	Cyto	
715a	Seq. ID No. 1503	Seq. ID No. 1504	Cyto	0
715b	Seq. ID No. 1505	Seq. ID No. 1506	Cyto	0
717	Seq. ID No. 1507	Seq. ID No. 1508	Cyto	
718a	Seq. ID No. 1509	Seq. ID No. 1510	Cyto	
721	Seq. ID No. 1511	Seq. ID No. 1512	Cyto	
724a	Seq. ID No. 1519	Seq. ID No. 1520	Cyto	0
724b	Seq. ID No. 1521	Seq. ID No. 1522	Cyto	0
724c	Seq. ID No. 1523	Seq. ID No. 1524	Cyto	0
724d	Seq. ID No. 1525	Seq. ID No. 1526	Cyto	0
726	Seq. ID No. 1527	Seq. ID No. 1528	Cyto	
728b	Seq. ID No. 1531	Seq. ID No. 1532	IM	8

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
730c	Seq. ID No. 1537	Seq. ID No. 1538	IM	5
730d	Seq. ID No. 1539	Seq. ID No. 1540	IM	5
731b	Seq. ID No. 1541	Seq. ID No. 1542	Cyto	1
732	Seq. ID No. 1543	Seq. ID No. 1544	Cyto	2
738c	Seq. ID No. 1549	Seq. ID No. 1550	IM	10
741a	Seq. ID No. 1555	Seq. ID No. 1556	Cyto	
741b	Seq. ID No. 1557	Seq. ID No. 1558	Cyto	
745a	Seq. ID No. 1565	Seq. ID No. 1566	IM	6
745b	Seq. ID No. 1567	Seq. ID No. 1568	IM	6
746a	Seq. ID No. 1569	Seq. ID No. 1570	IM	6
747	Seq. ID No. 1573	Seq. ID No. 1574	Cyto	
748a	Seq. ID No. 1575	Seq. ID No. 1576	Cyto	
748b	Seq. ID No. 1577	Seq. ID No. 1578	Cyto	
751	Seq. ID No. 1581	Seq. ID No. 1582	IM	1
754c	Seq. ID No. 1587	Seq. ID No. 1588	IM	9
754d	Seq. ID No. 1589	Seq. ID No. 1590	IM	9
756a	Seq. ID No. 1591	Seq. ID No. 1592	Cyto	1
756b	Seq. ID No. 1593	Seq. ID No. 1594	Cyto	1
758	Seq. ID No. 1595	Seq. ID No. 1596	Cyto	
760	Seq. ID No. 1597	Seq. ID No. 1598	Cyto	
762b	Seq. ID No. 1601	Seq. ID No. 1602	Cyto	0
762c	Seq. ID No. 1603	Seq. ID No. 1604	Cyto	0
763a	Seq. ID No. 1605	Seq. ID No. 1606	Cyto	
763b	Seq. ID No. 1607	Seq. ID No. 1608	Cyto	
764	Seq. ID No. 1609	Seq. ID No. 1610	Cyto	
766	Seq. ID No. 1611	Seq. ID No. 1612	Cyto	0
767	Seq. ID No. 1613	Seq. ID No. 1614	Cyto	
770a	Seq. ID No. 1615	Seq. ID No. 1616	IM	
770b	Seq. ID No. 1617	Seq. ID No. 1618	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
770c	Seq. ID No. 1619	Seq. ID No. 1620	Cyto	
772b	Seq. ID No. 1623	Seq. ID No. 1624	IM	6
774	Seq. ID No. 1625	Seq. ID No. 1626	Cyto	0
775	Seq. ID No. 1627	Seq. ID No. 1628	IM	7
777a	Seq. ID No. 1629	Seq. ID No. 1630	Cyto	
777c	Seq. ID No. 1631	Seq. ID No. 1632	OM	
780a	Seq. ID No. 1635	Seq. ID No. 1636	Cyto	
780b	Seq. ID No. 1637	Seq. ID No. 1638	Cyto	
785	Seq. ID No. 1641	Seq. ID No. 1642	Cyto	0
789b	Seq. ID No. 1651	Seq. ID No. 1652	IM	4
791	Seq. ID No. 1655	Seq. ID No. 1656	Cyto	
792	Seq. ID No. 1657	Seq. ID No. 1658	Cyto	
794a	Seq. ID No. 1659	Seq. ID No. 1660	Peri	0
795	Seq. ID No. 1667	Seq. ID No. 1668	Cyto	
797	Seq. ID No. 1669	Seq. ID No. 1670	Cyto	
799c	Seq. ID No. 1675	Seq. ID No. 1676	IM	9
803a	Seq. ID No. 1683	Seq. ID No. 1684	Cyto	3
803b	Seq. ID No. 1685	Seq. ID No. 1686	Cyto	3
804a	Seq. ID No. 1687	Seq. ID No. 1688	Cyto	
804b	Seq. ID No. 1689	Seq. ID No. 1690	Cyto	
807	Seq. ID No. 1691	Seq. ID No. 1692	Cyto	
809b	Seq. ID No. 1695	Seq. ID No. 1696	IM	4
812	Seq. ID No. 1697	Seq. ID No. 1698	Cyto	0
813	Seq. ID No. 1699	Seq. ID No. 1700	IM	5
816	Seq. ID No. 1701	Seq. ID No. 1702	IM	0
820a	Seq. ID No. 1703	Seq. ID No. 1704	IM	0
820b	Seq. ID No. 1705	Seq. ID No. 1706	IM	0
829a	Seq. ID No. 1709	Seq. ID No. 1710	Peri	
830	Seq. ID No. 1713	Seq. ID No. 1714	Cyto	



**TABLE 6: SIGNALP: NON-SECRETORY**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>PSORT</b>	<b>MSD</b>
834a	Seq. ID No. 1715	Seq. ID No. 1716	Cyto	
834b	Seq. ID No. 1717	Seq. ID No. 1718	Cyto	
834c	Seq. ID No. 1719	Seq. ID No. 1720	Cyto	
835a	Seq. ID No. 1721	Seq. ID No. 1722	Cyto	
835b	Seq. ID No. 1723	Seq. ID No. 1724	Cyto	
836a	Seq. ID No. 1725	Seq. ID No. 1726	Cyto	
836b	Seq. ID No. 1727	Seq. ID No. 1728	Cyto	
836c	Seq. ID No. 1729	Seq. ID No. 1730	Cyto	
837c	Seq. ID No. 1735	Seq. ID No. 1736	IM	8
847a	Seq. ID No. 1739	Seq. ID No. 1740	IM	1
847b	Seq. ID No. 1741	Seq. ID No. 1742	IM	1
848	Seq. ID No. 1743	Seq. ID No. 1744	Cyto	
849a	Seq. ID No. 1745	Seq. ID No. 1746	Cyto	
849b	Seq. ID No. 1747	Seq. ID No. 1748	IM	0
851a	Seq. ID No. 1749	Seq. ID No. 1750	Cyto	
851b	Seq. ID No. 1751	Seq. ID No. 1752	Cyto	
854	Seq. ID No. 1759	Seq. ID No. 1760	IM	2
855	Seq. ID No. 1761	Seq. ID No. 1762	Cyto	
857	Seq. ID No. 1763	Seq. ID No. 1764	Peri	1
859c	Seq. ID No. 1769	Seq. ID No. 1770	IM	6
860	Seq. ID No. 1773	Seq. ID No. 1774	Cyto	
862	Seq. ID No. 1775	Seq. ID No. 1776	Peri	0
863	Seq. ID No. 1777	Seq. ID No. 1778	Cyto	
864a	Seq. ID No. 1779	Seq. ID No. 1780	Cyto	1
866a	Seq. ID No. 1783	Seq. ID No. 1784	Cyto	
866b	Seq. ID No. 1785	Seq. ID No. 1786	Cyto	0
868b	Seq. ID No. 1789	Seq. ID No. 1790	IM	6
873a	Seq. ID No. 1793	Seq. ID No. 1794	Cyto	
873b	Seq. ID No. 1795	Seq. ID No. 1796	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
874a	Seq. ID No. 1799	Seq. ID No. 1800	Cyto	
874b	Seq. ID No. 1801	Seq. ID No. 1802	Cyto	
875	Seq. ID No. 1803	Seq. ID No. 1804	Cyto	
878a	Seq. ID No. 1807	Seq. ID No. 1808	Cyto	
878b	Seq. ID No. 1809	Seq. ID No. 1810	Cyto	
878c	Seq. ID No. 1811	Seq. ID No. 1812	Cyto	0
880a	Seq. ID No. 1813	Seq. ID No. 1814	IM	0
880b	Seq. ID No. 1815	Seq. ID No. 1816	IM	0
880c	Seq. ID No. 1817	Seq. ID No. 1818	IM	0
888	Seq. ID No. 1825	Seq. ID No. 1826	Cyto	
890a	Seq. ID No. 1827	Seq. ID No. 1828	Cyto	
890b	Seq. ID No. 1829	Seq. ID No. 1830	Cyto	
894	Seq. ID No. 1831	Seq. ID No. 1832	Cyto	
904	Seq. ID No. 1833	Seq. ID No. 1834	Peri	
907a	Seq. ID No. 1835	Seq. ID No. 1836	Cyto	1
907b	Seq. ID No. 1837	Seq. ID No. 1838	Cyto	1
908b	Seq. ID No. 1841	Seq. ID No. 1842	IM	9
908c	Seq. ID No. 1843	Seq. ID No. 1844	IM	9
911	Seq. ID No. 1845	Seq. ID No. 1846	Cyto	
912	Seq. ID No. 1847	Seq. ID No. 1848	Cyto	
916	Seq. ID No. 1849	Seq. ID No. 1850	Cyto	1
917	Seq. ID No. 1851	Seq. ID No. 1852	Cyto	
918b	Seq. ID No. 1853	Seq. ID No. 1854	Cyto	
918c	Seq. ID No. 1855	Seq. ID No. 1856	Cyto	
923	Seq. ID No. 1859	Seq. ID No. 1860	Cyto	0
925a	Seq. ID No. 1861	Seq. ID No. 1862	Cyto	0
925b	Seq. ID No. 1863	Seq. ID No. 1864	Cyto	0
926	Seq. ID No. 1865	Seq. ID No. 1866	Cyto	0
927	Seq. ID No. 1867	Seq. ID No. 1868	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
929b	Seq. ID No. 1871	Seq. ID No. 1872	Cyto	1
930	Seq. ID No. 1873	Seq. ID No. 1874	Cyto	1
932	Seq. ID No. 1877	Seq. ID No. 1878	Cyto	1
934a	Seq. ID No. 1879	Seq. ID No. 1880	Cyto	
934b	Seq. ID No. 1881	Seq. ID No. 1882	Cyto	
934c	Seq. ID No. 1883	Seq. ID No. 1884	Cyto	0
934d	Seq. ID No. 1885	Seq. ID No. 1886	Cyto	0
935	Seq. ID No. 1887	Seq. ID No. 1888	Cyto	0
938	Seq. ID No. 1889	Seq. ID No. 1890	Cyto	1
942	Seq. ID No. 1897	Seq. ID No. 1898	IM	
943	Seq. ID No. 1899	Seq. ID No. 1900	Cyto	
944a	Seq. ID No. 1901	Seq. ID No. 1902	Cyto	0
944b	Seq. ID No. 1903	Seq. ID No. 1904	Cyto	0
946	Seq. ID No. 1905	Seq. ID No. 1906	Cyto	0
949a	Seq. ID No. 1907	Seq. ID No. 1908	Cyto	
949b	Seq. ID No. 1909	Seq. ID No. 1910	IM	1
949c	Seq. ID No. 1911	Seq. ID No. 1912	IM	1
949d	Seq. ID No. 1913	Seq. ID No. 1914	IM	1
952a	Seq. ID No. 1921	Seq. ID No. 1922	IM	1
954	Seq. ID No. 1925	Seq. ID No. 1926	Cyto	0
956	Seq. ID No. 1931	Seq. ID No. 1932	IM	0
958a	Seq. ID No. 1933	Seq. ID No. 1934	Cyto	
958b	Seq. ID No. 1935	Seq. ID No. 1936	Cyto	
959	Seq. ID No. 1937	Seq. ID No. 1938	Cyto	
961a	Seq. ID No. 1939	Seq. ID No. 1940	Cyto	
961b	Seq. ID No. 1941	Seq. ID No. 1942	Cyto	
961c	Seq. ID No. 1943	Seq. ID No. 1944	Cyto	
963	Seq. ID No. 1945	Seq. ID No. 1946	Cyto	0
965a	Seq. ID No. 1947	Seq. ID No. 1948	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
965b	Seq. ID No. 1949	Seq. ID No. 1950	Cyto	
966a	Seq. ID No. 1951	Seq. ID No. 1952	Cyto	
966b	Seq. ID No. 1953	Seq. ID No. 1954	Cyto	
967a	Seq. ID No. 1955	Seq. ID No. 1956	IM	
967b	Seq. ID No. 1957	Seq. ID No. 1958	Cyto	
968	Seq. ID No. 1959	Seq. ID No. 1960	Cyto	0
969	Seq. ID No. 1961	Seq. ID No. 1962	IM	
972a	Seq. ID No. 1963	Seq. ID No. 1964	IM	
972b	Seq. ID No. 1965	Seq. ID No. 1966	IM	
976	Seq. ID No. 1967	Seq. ID No. 1968	Cyto	
977b	Seq. ID No. 1971	Seq. ID No. 1972	Cyto	1
978a	Seq. ID No. 1973	Seq. ID No. 1974	Cyto	
978b	Seq. ID No. 1975	Seq. ID No. 1976	Cyto	
979	Seq. ID No. 1977	Seq. ID No. 1978	IM	1
980	Seq. ID No. 1979	Seq. ID No. 1980	Cyto	0
982	Seq. ID No. 1983	Seq. ID No. 1984	Cyto	
984a	Seq. ID No. 1985	Seq. ID No. 1986	Cyto	
984b	Seq. ID No. 1987	Seq. ID No. 1988	Cyto	
986	Seq. ID No. 1989	Seq. ID No. 1990	Cyto	
988b	Seq. ID No. 1995	Seq. ID No. 1996	IM	6
988c	Seq. ID No. 1997	Seq. ID No. 1998	IM	6
988d	Seq. ID No. 1999	Seq. ID No. 2000	IM	6
991	Seq. ID No. 2001	Seq. ID No. 2002	IM	
992	Seq. ID No. 2003	Seq. ID No. 2004	Cyto	0
994	Seq. ID No. 2007	Seq. ID No. 2008	Cyto	2
995	Seq. ID No. 2009	Seq. ID No. 2010	IM	1
997	Seq. ID No. 2011	Seq. ID No. 2012	IM	
998b	Seq. ID No. 2015	Seq. ID No. 2016	IM	5
1000	Seq. ID No. 2021	Seq. ID No. 2022	Cyto	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1001	Seq. ID No. 2023	Seq. ID No. 2024	Cyto	
1004a	Seq. ID No. 2029	Seq. ID No. 2030	IM	1
1004b	Seq. ID No. 2031	Seq. ID No. 2032	IM	1
1007	Seq. ID No. 2037	Seq. ID No. 2038	Cyto	
1012	Seq. ID No. 2039	Seq. ID No. 2040	IM	1
1013b	Seq. ID No. 2043	Seq. ID No. 2044	IM	6
1013c	Seq. ID No. 2045	Seq. ID No. 2046	IM	6
1016c	Seq. ID No. 2047	Seq. ID No. 2048	Cyto	
1017b	Seq. ID No. 2051	Seq. ID No. 2052	IM	5
1018a	Seq. ID No. 2057	Seq. ID No. 2058	Cyto	
1018b	Seq. ID No. 2059	Seq. ID No. 2060	Cyto	
1021a	Seq. ID No. 2061	Seq. ID No. 2062	Cyto	1
1021b	Seq. ID No. 2063	Seq. ID No. 2064	Cyto	1
1021c	Seq. ID No. 2065	Seq. ID No. 2066	Cyto	1
1024	Seq. ID No. 2067	Seq. ID No. 2068	Cyto	
1025	Seq. ID No. 2069	Seq. ID No. 2070	Cyto	
1026	Seq. ID No. 2071	Seq. ID No. 2072	Cyto	
1029	Seq. ID No. 2073	Seq. ID No. 2074	Cyto	
1033a	Seq. ID No. 2075	Seq. ID No. 2076	IM	0
1033b	Seq. ID No. 2077	Seq. ID No. 2078	IM	0
1033c	Seq. ID No. 2079	Seq. ID No. 2080	IM	0
1035a	Seq. ID No. 2081	Seq. ID No. 2082	IM	1
1035b	Seq. ID No. 2083	Seq. ID No. 2084	IM	1
1035c	Seq. ID No. 2085	Seq. ID No. 2086	IM	1
1037	Seq. ID No. 2093	Seq. ID No. 2094	Cyto	
1039a	Seq. ID No. 2095	Seq. ID No. 2096	Cyto	0
1039b	Seq. ID No. 2097	Seq. ID No. 2098	Cyto	0
1041	Seq. ID No. 2099	Seq. ID No. 2100	Cyto	
1042a	Seq. ID No. 2101	Seq. ID No. 2102	Cyto	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1042b	Seq. ID No. 2103	Seq. ID No. 2104	Cyto	1
1044d	Seq. ID No. 2111	Seq. ID No. 2112	IM	3
1049a	Seq. ID No. 2117	Seq. ID No. 2118	Cyto	0
1049b	Seq. ID No. 2119	Seq. ID No. 2120	Cyto	0
1055	Seq. ID No. 2129	Seq. ID No. 2130	Cyto	
1056a	Seq. ID No. 2131	Seq. ID No. 2132	Cyto	
1056b	Seq. ID No. 2133	Seq. ID No. 2134	Cyto	
1057	Seq. ID No. 2135	Seq. ID No. 2136	Cyto	0
1058	Seq. ID No. 2137	Seq. ID No. 2138	Cyto	1
1060a	Seq. ID No. 2139	Seq. ID No. 2140	IM	1
1060b	Seq. ID No. 2141	Seq. ID No. 2142	IM	1
1062	Seq. ID No. 2143	Seq. ID No. 2144	Cyto	
1063	Seq. ID No. 2145	Seq. ID No. 2146	Cyto	1
1064	Seq. ID No. 2147	Seq. ID No. 2148	Cyto	
1065c	Seq. ID No. 2153	Seq. ID No. 2154	IM	1
1069	Seq. ID No. 2161	Seq. ID No. 2162	IM	1
1070a	Seq. ID No. 2163	Seq. ID No. 2164	Cyto	
1070b	Seq. ID No. 2165	Seq. ID No. 2166	Cyto	
1076a	Seq. ID No. 2167	Seq. ID No. 2168	IM	2
1076b	Seq. ID No. 2169	Seq. ID No. 2170	IM	2
1077c	Seq. ID No. 2175	Seq. ID No. 2176	IM	12
1077e	Seq. ID No. 2179	Seq. ID No. 2180	IM	15
1079a	Seq. ID No. 2181	Seq. ID No. 2182	Cyto	
1079b	Seq. ID No. 2183	Seq. ID No. 2184	Cyto	
1080a	Seq. ID No. 2185	Seq. ID No. 2186	Cyto	
1081b	Seq. ID No. 2189	Seq. ID No. 2190	IM	1
1085	Seq. ID No. 2193	Seq. ID No. 2194	Cyto	
1086	Seq. ID No. 2195	Seq. ID No. 2196	IM	1
1087a	Seq. ID No. 2197	Seq. ID No. 2198	IM	0

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1087b	Seq. ID No. 2199	Seq. ID No. 2200	IM	0
1091a	Seq. ID No. 2201	Seq. ID No. 2202	Cyto	
1091b	Seq. ID No. 2203	Seq. ID No. 2204	Peri	
1094b	Seq. ID No. 2207	Seq. ID No. 2208	IM	2
1095a	Seq. ID No. 2209	Seq. ID No. 2210	Cyto	
1095b	Seq. ID No. 2211	Seq. ID No. 2212	Cyto	
1096a	Seq. ID No. 2213	Seq. ID No. 2214	Cyto	0
1096b	Seq. ID No. 2215	Seq. ID No. 2216	Cyto	0
1096c	Seq. ID No. 2217	Seq. ID No. 2218	Cyto	0
1097	Seq. ID No. 2219	Seq. ID No. 2220	IM	2
1098b	Seq. ID No. 2221	Seq. ID No. 2222	IM	2
1100	Seq. ID No. 2223	Seq. ID No. 2224	Cyto	
1101a	Seq. ID No. 2225	Seq. ID No. 2226	Cyto	
1101b	Seq. ID No. 2227	Seq. ID No. 2228	Cyto	
1104	Seq. ID No. 2229	Seq. ID No. 2230	Cyto	
1106	Seq. ID No. 2231	Seq. ID No. 2232	Cyto	
1108a	Seq. ID No. 2233	Seq. ID No. 2234	Cyto	
1108b	Seq. ID No. 2235	Seq. ID No. 2236	Cyto	
1111c	Seq. ID No. 2241	Seq. ID No. 2242	IM	8
1112a	Seq. ID No. 2243	Seq. ID No. 2244	IM	1
1126a	Seq. ID No. 2247	Seq. ID No. 2248	IM	3
1127	Seq. ID No. 2253	Seq. ID No. 2254	Cyto	
1131	Seq. ID No. 2257	Seq. ID No. 2258	Cyto	1
1135a	Seq. ID No. 2261	Seq. ID No. 2262	IM	1
1135b	Seq. ID No. 2263	Seq. ID No. 2264	IM	1
1136a	Seq. ID No. 2265	Seq. ID No. 2266	IM	
1136b	Seq. ID No. 2267	Seq. ID No. 2268	IM	
1138	Seq. ID No. 2269	Seq. ID No. 2270	Cyto	
1140b	Seq. ID No. 2273	Seq. ID No. 2274	IM	3

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1140c	Seq. ID No. 2275	Seq. ID No. 2276	IM	6
1141a	Seq. ID No. 2277	Seq. ID No. 2278	Cyto	1
1141b	Seq. ID No. 2279	Seq. ID No. 2280	Cyto	1
1142	Seq. ID No. 2281	Seq. ID No. 2282	Cyto	
1144b	Seq. ID No. 2285	Seq. ID No. 2286	IM	4
1144c	Seq. ID No. 2287	Seq. ID No. 2288	IM	5
1146e	Seq. ID No. 2297	Seq. ID No. 2298	IM	10
1148	Seq. ID No. 2299	Seq. ID No. 2300	Cyto	0
1149	Seq. ID No. 2301	Seq. ID No. 2302	IM	0
1152d	Seq. ID No. 2309	Seq. ID No. 2310	IM	7
1152e	Seq. ID No. 2311	Seq. ID No. 2312	IM	8
1152f	Seq. ID No. 2313	Seq. ID No. 2314	IM	8
1152g	Seq. ID No. 2315	Seq. ID No. 2316	IM	8
1158a	Seq. ID No. 2331	Seq. ID No. 2332	Cyto	
1160	Seq. ID No. 2335	Seq. ID No. 2336	Cyto	
1161a	Seq. ID No. 2337	Seq. ID No. 2338	Cyto	
1161b	Seq. ID No. 2339	Seq. ID No. 2340	Cyto	
1162	Seq. ID No. 2341	Seq. ID No. 2342	Cyto	
1166	Seq. ID No. 2345	Seq. ID No. 2346	Cyto	
1170	Seq. ID No. 2359	Seq. ID No. 2360	Cyto	0
1171a	Seq. ID No. 2361	Seq. ID No. 2362	Cyto	
1171c	Seq. ID No. 2363	Seq. ID No. 2364	Cyto	
1174	Seq. ID No. 2369	Seq. ID No. 2370	Cyto	2
1177	Seq. ID No. 2373	Seq. ID No. 2374	Cyto	1
1179a	Seq. ID No. 2377	Seq. ID No. 2378	Cyto	0
1179b	Seq. ID No. 2379	Seq. ID No. 2380	Cyto	0
1179c	Seq. ID No. 2381	Seq. ID No. 2382	Cyto	0
1180a	Seq. ID No. 2383	Seq. ID No. 2384	Cyto	1
1180b	Seq. ID No. 2385	Seq. ID No. 2386	IM	2



TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1182b	Seq. ID No. 2395	Seq. ID No. 2396	IM	2
1183a	Seq. ID No. 2397	Seq. ID No. 2398	IM	0
1183b	Seq. ID No. 2399	Seq. ID No. 2400	IM	0
1184	Seq. ID No. 2401	Seq. ID No. 2402	Cyto	1
1185a	Seq. ID No. 2403	Seq. ID No. 2404	Cyto	0
1185b	Seq. ID No. 2405	Seq. ID No. 2406	Cyto	0
1186b	Seq. ID No. 2409	Seq. ID No. 2410	IM	5
1188a	Seq. ID No. 2411	Seq. ID No. 2412	IM	2
1188b	Seq. ID No. 2413	Seq. ID No. 2414	IM	4
1188c	Seq. ID No. 2415	Seq. ID No. 2416	IM	4
1191	Seq. ID No. 2417	Seq. ID No. 2418	IM	0
1194	Seq. ID No. 2423	Seq. ID No. 2424	IM	1
1198	Seq. ID No. 2431	Seq. ID No. 2432	Cyto	
1199b	Seq. ID No. 2435	Seq. ID No. 2436	IM	3
1200	Seq. ID No. 2437	Seq. ID No. 2438	Cyto	0
1201	Seq. ID No. 2439	Seq. ID No. 2440	Cyto	
1202a	Seq. ID No. 2441	Seq. ID No. 2442	IM	3
1202b	Seq. ID No. 2443	Seq. ID No. 2444	IM	3
1205	Seq. ID No. 2445	Seq. ID No. 2446	IM	3
1206	Seq. ID No. 2447	Seq. ID No. 2448	Cyto	0
1208	Seq. ID No. 2451	Seq. ID No. 2452	Cyto	
1209	Seq. ID No. 2453	Seq. ID No. 2454	IM	4
1210a	Seq. ID No. 2455	Seq. ID No. 2456	IM	3
1210b	Seq. ID No. 2457	Seq. ID No. 2458	IM	4
1213a	Seq. ID No. 2461	Seq. ID No. 2462	Cyto	1
1213b	Seq. ID No. 2463	Seq. ID No. 2464	Cyto	1
1214	Seq. ID No. 2465	Seq. ID No. 2466	IM	
1215a	Seq. ID No. 2467	Seq. ID No. 2468	Cyto	0
1215b	Seq. ID No. 2469	Seq. ID No. 2470	Cyto	0

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1217c	Seq. ID No. 2471	Seq. ID No. 2472	Cyto	
1218a	Seq. ID No. 2473	Seq. ID No. 2474	IM	2
1218b	Seq. ID No. 2475	Seq. ID No. 2476	IM	2
1219	Seq. ID No. 2477	Seq. ID No. 2478	Cyto	
1220	Seq. ID No. 2479	Seq. ID No. 2480	Cyto	
1221a	Seq. ID No. 2481	Seq. ID No. 2482	IM	
1221b	Seq. ID No. 2483	Seq. ID No. 2484	IM	
1223	Seq. ID No. 2485	Seq. ID No. 2486	Cyto	
1226	Seq. ID No. 2495	Seq. ID No. 2496	Cyto	
1230	Seq. ID No. 2505	Seq. ID No. 2506	Cyto	0
1233a	Seq. ID No. 2509	Seq. ID No. 2510	IM	
1233b	Seq. ID No. 2511	Seq. ID No. 2512	IM	
1233c	Seq. ID No. 2513	Seq. ID No. 2514	IM	
1234c	Seq. ID No. 2519	Seq. ID No. 2520	IM	6
1235	Seq. ID No. 2521	Seq. ID No. 2522	Cyto	1
1240	Seq. ID No. 2529	Seq. ID No. 2530	Cyto	
1244	Seq. ID No. 2539	Seq. ID No. 2540	Cyto	0
1245d	Seq. ID No. 2547	Seq. ID No. 2548	IM	12
1245e	Seq. ID No. 2549	Seq. ID No. 2550	IM	12
1246a	Seq. ID No. 2551	Seq. ID No. 2552	Cyto	
1246b	Seq. ID No. 2553	Seq. ID No. 2554	Cyto	
1250c	Seq. ID No. 2559	Seq. ID No. 2560	IM	9
1250d	Seq. ID No. 2561	Seq. ID No. 2562	IM	10
1250e	Seq. ID No. 2563	Seq. ID No. 2564	IM	10
1251b	Seq. ID No. 2567	Seq. ID No. 2568	IM	3
1253c	Seq. ID No. 2573	Seq. ID No. 2574	IM	7
1253d	Seq. ID No. 2575	Seq. ID No. 2576	IM	7
1256	Seq. ID No. 2577	Seq. ID No. 2578	Cyto	1
1257a	Seq. ID No. 2579	Seq. ID No. 2580	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1257b	Seq. ID No. 2581	Seq. ID No. 2582	Cyto	
1258b	Seq. ID No. 2585	Seq. ID No. 2586	IM	7
1258c	Seq. ID No. 2587	Seq. ID No. 2588	IM	7
1258d	Seq. ID No. 2589	Seq. ID No. 2590	IM	7
1263	Seq. ID No. 2593	Seq. ID No. 2594	Cyto	0
1265	Seq. ID No. 2595	Seq. ID No. 2596	Cyto	1
1267b	Seq. ID No. 2603	Seq. ID No. 2604	IM	3
1268a	Seq. ID No. 2605	Seq. ID No. 2606	IM	3
1269	Seq. ID No. 2609	Seq. ID No. 2610	Cyto	
1271	Seq. ID No. 2613	Seq. ID No. 2614	Cyto	
1272a	Seq. ID No. 2615	Seq. ID No. 2616	Cyto	
1272b	Seq. ID No. 2617	Seq. ID No. 2618	Cyto	0
1273	Seq. ID No. 2619	Seq. ID No. 2620	Cyto	0
1275b	Seq. ID No. 2623	Seq. ID No. 2624	Cyto	1
1277	Seq. ID No. 2625	Seq. ID No. 2626	Cyto	1
1279	Seq. ID No. 2631	Seq. ID No. 2632	Cyto	0
1281	Seq. ID No. 2633	Seq. ID No. 2634	Cyto	0
1283a	Seq. ID No. 2635	Seq. ID No. 2636	Cyto	
1283b	Seq. ID No. 2637	Seq. ID No. 2638	Cyto	
1283c	Seq. ID No. 2639	Seq. ID No. 2640	Cyto	
1284	Seq. ID No. 2641	Seq. ID No. 2642	Cyto	
1285a	Seq. ID No. 2643	Seq. ID No. 2644	Cyto	0
1285b	Seq. ID No. 2645	Seq. ID No. 2646	Cyto	0
1287a	Seq. ID No. 2647	Seq. ID No. 2648	Cyto	
1287b	Seq. ID No. 2649	Seq. ID No. 2650	Cyto	
1289	Seq. ID No. 2653	Seq. ID No. 2654	IM	1
1290	Seq. ID No. 2655	Seq. ID No. 2656	Cyto	
1293a	Seq. ID No. 2657	Seq. ID No. 2658	Cyto	
1293b	Seq. ID No. 2659	Seq. ID No. 2660	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1294a	Seq. ID No. 2661	Seq. ID No. 2662	Cyto	
1295	Seq. ID No. 2663	Seq. ID No. 2664	Cyto	
1297a	Seq. ID No. 2665	Seq. ID No. 2666	Cyto	
1297b	Seq. ID No. 2667	Seq. ID No. 2668	Cyto	
1300	Seq. ID No. 2669	Seq. ID No. 2670	Cyto	
1302	Seq. ID No. 2671	Seq. ID No. 2672	Cyto	
1305a	Seq. ID No. 2673	Seq. ID No. 2674	Cyto	
1305b	Seq. ID No. 2675	Seq. ID No. 2676	Cyto	
1305c	Seq. ID No. 2677	Seq. ID No. 2678	Cyto	
1308d	Seq. ID No. 2685	Seq. ID No. 2686	IM	4
1308e	Seq. ID No. 2687	Seq. ID No. 2688	IM	4
1311	Seq. ID No. 2689	Seq. ID No. 2690	Cyto	
1320c	Seq. ID No. 2709	Seq. ID No. 2710	IM	5
1321	Seq. ID No. 2711	Seq. ID No. 2712	Cyto	
1322a	Seq. ID No. 2713	Seq. ID No. 2714	Cyto	
1322b	Seq. ID No. 2715	Seq. ID No. 2716	Cyto	
1324	Seq. ID No. 2719	Seq. ID No. 2720	Cyto	
1326a	Seq. ID No. 2721	Seq. ID No. 2722	Cyto	
1326b	Seq. ID No. 2723	Seq. ID No. 2724	Cyto	
1326c	Seq. ID No. 2725	Seq. ID No. 2726	Cyto	
1333	Seq. ID No. 2727	Seq. ID No. 2728	Cyto	0
1335b	Seq. ID No. 2735	Seq. ID No. 2736	IM	3
1337	Seq. ID No. 2737	Seq. ID No. 2738	Cyto	
1338	Seq. ID No. 2739	Seq. ID No. 2740	IM	1
1340a	Seq. ID No. 2741	Seq. ID No. 2742	IM	1
1340b	Seq. ID No. 2743	Seq. ID No. 2744	IM	1
1341a	Seq. ID No. 2745	Seq. ID No. 2746	IM	3
1341c	Seq. ID No. 2747	Seq. ID No. 2748	IM	4
1344a	Seq. ID No. 2749	Seq. ID No. 2750	Cyto	0

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1344b	Seq. ID No. 2751	Seq. ID No. 2752	Cyto	0
1348	Seq. ID No. 2753	Seq. ID No. 2754	IM	5
1349a	Seq. ID No. 2755	Seq. ID No. 2756	IM	1
1349b	Seq. ID No. 2757	Seq. ID No. 2758	IM	1
1349c	Seq. ID No. 2759	Seq. ID No. 2760	IM	1
1350a	Seq. ID No. 2761	Seq. ID No. 2762	Cyto	
1350b	Seq. ID No. 2763	Seq. ID No. 2764	Cyto	
1353	Seq. ID No. 2765	Seq. ID No. 2766	Cyto	2
1355	Seq. ID No. 2767	Seq. ID No. 2768	Cyto	
1358a	Seq. ID No. 2769	Seq. ID No. 2770	Cyto	0
1358b	Seq. ID No. 2771	Seq. ID No. 2772	Cyto	0
1359	Seq. ID No. 2773	Seq. ID No. 2774	Cyto	1
1361	Seq. ID No. 2775	Seq. ID No. 2776	Cyto	
1364a	Seq. ID No. 2777	Seq. ID No. 2778	Cyto	
1364b	Seq. ID No. 2779	Seq. ID No. 2780	Cyto	
1364c	Seq. ID No. 2781	Seq. ID No. 2782	Cyto	
1366b	Seq. ID No. 2787	Seq. ID No. 2788	IM	1
1367	Seq. ID No. 2789	Seq. ID No. 2790	Cyto	1
1368	Seq. ID No. 2791	Seq. ID No. 2792	Cyto	0
1371	Seq. ID No. 2793	Seq. ID No. 2794	Cyto	
1373a	Seq. ID No. 2795	Seq. ID No. 2796	Cyto	
1373b	Seq. ID No. 2797	Seq. ID No. 2798	Cyto	
1374	Seq. ID No. 2799	Seq. ID No. 2800	IM	
1377	Seq. ID No. 2803	Seq. ID No. 2804	IM	0
1378	Seq. ID No. 2805	Seq. ID No. 2806	IM	0
1379	Seq. ID No. 2807	Seq. ID No. 2808	IM	1
1381a	Seq. ID No. 2811	Seq. ID No. 2812	IM	1
1383	Seq. ID No. 2817	Seq. ID No. 2818	Cyto	
1386a	Seq. ID No. 2825	Seq. ID No. 2826	IM	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1386b	Seq. ID No. 2827	Seq. ID No. 2828	IM	1
1387a	Seq. ID No. 2829	Seq. ID No. 2830	OM	1
1394	Seq. ID No. 2843	Seq. ID No. 2844	Cyto	1
1396	Seq. ID No. 2847	Seq. ID No. 2848	Cyto	
1397	Seq. ID No. 2849	Seq. ID No. 2850	Peri	
1398	Seq. ID No. 2851	Seq. ID No. 2852	Cyto	
1400	Seq. ID No. 2857	Seq. ID No. 2858	IM	1
1405	Seq. ID No. 2863	Seq. ID No. 2864	IM	2
1407b	Seq. ID No. 2865	Seq. ID No. 2866	IM	1
1408	Seq. ID No. 2867	Seq. ID No. 2868	IM	5
1409	Seq. ID No. 2869	Seq. ID No. 2870	IM	1
1410	Seq. ID No. 2871	Seq. ID No. 2872	Cyto	
1411b	Seq. ID No. 2875	Seq. ID No. 2876	IM	4
1411c	Seq. ID No. 2877	Seq. ID No. 2878	IM	6
1412a	Seq. ID No. 2879	Seq. ID No. 2880	IM	8
1414a	Seq. ID No. 2883	Seq. ID No. 2884	IM	0
1414b	Seq. ID No. 2885	Seq. ID No. 2886	IM	0
1414c	Seq. ID No. 2887	Seq. ID No. 2888	IM	0
1415	Seq. ID No. 2889	Seq. ID No. 2890	Cyto	
1416	Seq. ID No. 2891	Seq. ID No. 2892	Cyto	
1419	Seq. ID No. 2895	Seq. ID No. 2896	IM	
1420a	Seq. ID No. 2897	Seq. ID No. 2898	IM	0
1420b	Seq. ID No. 2899	Seq. ID No. 2900	IM	0
1422	Seq. ID No. 2901	Seq. ID No. 2902	Cyto	0
1423	Seq. ID No. 2903	Seq. ID No. 2904	Cyto	
1426b	Seq. ID No. 2907	Seq. ID No. 2908	IM	6
1427a	Seq. ID No. 2909	Seq. ID No. 2910	Cyto	
1427b	Seq. ID No. 2911	Seq. ID No. 2912	Cyto	
1428	Seq. ID No. 2913	Seq. ID No. 2914	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1429a	Seq. ID No. 2915	Seq. ID No. 2916	Cyto	
1429b	Seq. ID No. 2917	Seq. ID No. 2918	IM	
1431	Seq. ID No. 2919	Seq. ID No. 2920	Cyto	0
1432	Seq. ID No. 2921	Seq. ID No. 2922	Cyto	0
1433	Seq. ID No. 2923	Seq. ID No. 2924	Cyto	0
1434a	Seq. ID No. 2925	Seq. ID No. 2926	Cyto	1
1434b	Seq. ID No. 2927	Seq. ID No. 2928	Cyto	1
1437a	Seq. ID No. 2929	Seq. ID No. 2930	Cyto	0
1437b	Seq. ID No. 2931	Seq. ID No. 2932	Cyto	0
1437c	Seq. ID No. 2933	Seq. ID No. 2934	Cyto	0
1439d	Seq. ID No. 2943	Seq. ID No. 2944	IM	7
1439e	Seq. ID No. 2945	Seq. ID No. 2946	IM	7
1440d	Seq. ID No. 2953	Seq. ID No. 2954	IM	12
1442a	Seq. ID No. 2955	Seq. ID No. 2956	Cyto	
1442b	Seq. ID No. 2957	Seq. ID No. 2958	Cyto	
1445a	Seq. ID No. 2959	Seq. ID No. 2960	Cyto	
1445b	Seq. ID No. 2961	Seq. ID No. 2962	Cyto	
1445c	Seq. ID No. 2963	Seq. ID No. 2964	Cyto	
1446a	Seq. ID No. 2965	Seq. ID No. 2966	IM	2
1446b	Seq. ID No. 2967	Seq. ID No. 2968	IM	2
1447b	Seq. ID No. 2971	Seq. ID No. 2972	IM	11
1451	Seq. ID No. 2979	Seq. ID No. 2980	Cyto	
1453	Seq. ID No. 2985	Seq. ID No. 2986	IM	5
1455a	Seq. ID No. 2989	Seq. ID No. 2990	Cyto	
1456	Seq. ID No. 2993	Seq. ID No. 2994	Cyto	
1457c	Seq. ID No. 2999	Seq. ID No. 3000	IM	8
1459	Seq. ID No. 3001	Seq. ID No. 3002	IM	1
1462a	Seq. ID No. 3003	Seq. ID No. 3004	IM	5
1466b	Seq. ID No. 3015	Seq. ID No. 3016	IM	2

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1466c	Seq. ID No. 3017	Seq. ID No. 3018	IM	2
1466d	Seq. ID No. 3019	Seq. ID No. 3020	IM	2
1467	Seq. ID No. 3021	Seq. ID No. 3022	Cyto	2
1470c	Seq. ID No. 3033	Seq. ID No. 3034	IM	8
1471	Seq. ID No. 3035	Seq. ID No. 3036	IM	6
1472b	Seq. ID No. 3037	Seq. ID No. 3038	IM	
1472c	Seq. ID No. 3039	Seq. ID No. 3040	Cyto	
1474	Seq. ID No. 3041	Seq. ID No. 3042	Cyto	
1476	Seq. ID No. 3045	Seq. ID No. 3046	IM	5
1477a	Seq. ID No. 3047	Seq. ID No. 3048	Cyto	0
1477b	Seq. ID No. 3049	Seq. ID No. 3050	Cyto	0
1479a	Seq. ID No. 3051	Seq. ID No. 3052	Cyto	
1479b	Seq. ID No. 3053	Seq. ID No. 3054	Cyto	
1482a	Seq. ID No. 3057	Seq. ID No. 3058	Cyto	0
1482b	Seq. ID No. 3059	Seq. ID No. 3060	Cyto	0
1483	Seq. ID No. 3061	Seq. ID No. 3062	Cyto	
1484b	Seq. ID No. 3065	Seq. ID No. 3066	IM	4
1484c	Seq. ID No. 3067	Seq. ID No. 3068	IM	4
1486	Seq. ID No. 3069	Seq. ID No. 3070	Cyto	
1488d	Seq. ID No. 3079	Seq. ID No. 3080	IM	4
1488e	Seq. ID No. 3081	Seq. ID No. 3082	IM	4
1488f	Seq. ID No. 3083	Seq. ID No. 3084	IM	4
1488g	Seq. ID No. 3085	Seq. ID No. 3086	IM	4
1489	Seq. ID No. 3087	Seq. ID No. 3088	Cyto	
1490	Seq. ID No. 3089	Seq. ID No. 3090	Cyto	
1494	Seq. ID No. 3091	Seq. ID No. 3092	Cyto	
1497	Seq. ID No. 3093	Seq. ID No. 3094	Cyto	0
1498a	Seq. ID No. 3095	Seq. ID No. 3096	Cyto	
1498b	Seq. ID No. 3097	Seq. ID No. 3098	Cyto	



TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1498c	Seq. ID No. 3099	Seq. ID No. 3100	Cyto	
1498d	Seq. ID No. 3101	Seq. ID No. 3102	Cyto	
1499	Seq. ID No. 3103	Seq. ID No. 3104	Cyto	
1502a	Seq. ID No. 3105	Seq. ID No. 3106	Cyto	
1502b	Seq. ID No. 3107	Seq. ID No. 3108	Cyto	
1503a	Seq. ID No. 3109	Seq. ID No. 3110	IM	4
1503b	Seq. ID No. 3111	Seq. ID No. 3112	IM	4
1506a	Seq. ID No. 3113	Seq. ID No. 3114	Cyto	0
1506b	Seq. ID No. 3115	Seq. ID No. 3116	Cyto	0
1506c	Seq. ID No. 3117	Seq. ID No. 3118	Cyto	0
1508	Seq. ID No. 3125	Seq. ID No. 3126	Cyto	0
1510a	Seq. ID No. 3127	Seq. ID No. 3128	IM	0
1510b	Seq. ID No. 3129	Seq. ID No. 3130	IM	0
1510c	Seq. ID No. 3131	Seq. ID No. 3132	IM	0
1510d	Seq. ID No. 3133	Seq. ID No. 3134	IM	0
1511	Seq. ID No. 3135	Seq. ID No. 3136	IM	0
1512	Seq. ID No. 3137	Seq. ID No. 3138	Cyto	
1513a	Seq. ID No. 3139	Seq. ID No. 3140	Cyto	
1513b	Seq. ID No. 3141	Seq. ID No. 3142	Cyto	
1516	Seq. ID No. 3143	Seq. ID No. 3144	Cyto	
1517b	Seq. ID No. 3147	Seq. ID No. 3148	IM	3
1517c	Seq. ID No. 3149	Seq. ID No. 3150	IM	3
1518a	Seq. ID No. 3151	Seq. ID No. 3152	Cyto	0
1518b	Seq. ID No. 3153	Seq. ID No. 3154	Cyto	0
1523	Seq. ID No. 3159	Seq. ID No. 3160	Cyto	0
1528	Seq. ID No. 3161	Seq. ID No. 3162	Cyto	
1533a	Seq. ID No. 3167	Seq. ID No. 3168	IM	0
1534a	Seq. ID No. 3169	Seq. ID No. 3170	Cyto	0
1534b	Seq. ID No. 3171	Seq. ID No. 3172	Cyto	0

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1536a	Seq. ID No. 3175	Seq. ID No. 3176	Cyto	
1536b	Seq. ID No. 3177	Seq. ID No. 3178	Cyto	0
1537	Seq. ID No. 3179	Seq. ID No. 3180	Cyto	
1542	Seq. ID No. 3181	Seq. ID No. 3182	IM	0
1544	Seq. ID No. 3185	Seq. ID No. 3186	Cyto	1
1547a	Seq. ID No. 3187	Seq. ID No. 3188	Cyto	
1547b	Seq. ID No. 3189	Seq. ID No. 3190	Cyto	
1548	Seq. ID No. 3191	Seq. ID No. 3192	Cyto	
1553a	Seq. ID No. 3195	Seq. ID No. 3196	Cyto	
1553b	Seq. ID No. 3197	Seq. ID No. 3198	Cyto	
1554a	Seq. ID No. 3199	Seq. ID No. 3200	IM	1
1554c	Seq. ID No. 3203	Seq. ID No. 3204	IM	3
1555	Seq. ID No. 3205	Seq. ID No. 3206	IM	1
1556a	Seq. ID No. 3207	Seq. ID No. 3208	Cyto	
1556b	Seq. ID No. 3209	Seq. ID No. 3210	Cyto	
1556c	Seq. ID No. 3211	Seq. ID No. 3212	Cyto	
1559b	Seq. ID No. 3221	Seq. ID No. 3222	IM	7
1563	Seq. ID No. 3223	Seq. ID No. 3224	Cyto	
1564a	Seq. ID No. 3225	Seq. ID No. 3226	Cyto	1
1564b	Seq. ID No. 3227	Seq. ID No. 3228	Cyto	1
1565	Seq. ID No. 3229	Seq. ID No. 3230	Cyto	
1567	Seq. ID No. 3231	Seq. ID No. 3232	Cyto	
1568b	Seq. ID No. 3233	Seq. ID No. 3234	IM	1
1569	Seq. ID No. 3235	Seq. ID No. 3236	IM	2
1570	Seq. ID No. 3237	Seq. ID No. 3238	Peri	2
1571	Seq. ID No. 3239	Seq. ID No. 3240	IM	5
1572d	Seq. ID No. 3247	Seq. ID No. 3248	IM	11
1573	Seq. ID No. 3251	Seq. ID No. 3252	Cyto	
1576	Seq. ID No. 3253	Seq. ID No. 3254	Cyto	

**TABLE 6: SIGNALP: NON-SECRETORY**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>PSORT</b>	<b>MSD</b>
1578	Seq. ID No. 3259	Seq. ID No. 3260	IM	2
1581	Seq. ID No. 3265	Seq. ID No. 3266	IM	1
1582a	Seq. ID No. 3267	Seq. ID No. 3268	IM	
1582c	Seq. ID No. 3271	Seq. ID No. 3272	IM	1
1584	Seq. ID No. 3273	Seq. ID No. 3274	Peri	1
1587a	Seq. ID No. 3279	Seq. ID No. 3280	Cyto	
1587b	Seq. ID No. 3281	Seq. ID No. 3282	Cyto	
1587c	Seq. ID No. 3283	Seq. ID No. 3284	Cyto	
1588	Seq. ID No. 3285	Seq. ID No. 3286	IM	0
1590	Seq. ID No. 3287	Seq. ID No. 3288	Cyto	
1591	Seq. ID No. 3289	Seq. ID No. 3290	Cyto	
1592a	Seq. ID No. 3291	Seq. ID No. 3292	Cyto	
1592b	Seq. ID No. 3293	Seq. ID No. 3294	Cyto	
1593	Seq. ID No. 3295	Seq. ID No. 3296	Cyto	
1594b	Seq. ID No. 3299	Seq. ID No. 3300	IM	1
1595a	Seq. ID No. 3301	Seq. ID No. 3302	Cyto	0
1595b	Seq. ID No. 3303	Seq. ID No. 3304	Cyto	0
1598a	Seq. ID No. 3305	Seq. ID No. 3306	Cyto	0
1598b	Seq. ID No. 3307	Seq. ID No. 3308	Cyto	0
1600a	Seq. ID No. 3309	Seq. ID No. 3310	Cyto	1
1600b	Seq. ID No. 3311	Seq. ID No. 3312	Cyto	1
1600c	Seq. ID No. 3313	Seq. ID No. 3314	Cyto	1
1602	Seq. ID No. 3315	Seq. ID No. 3316	Cyto	
1606b	Seq. ID No. 3319	Seq. ID No. 3320	IM	2
1607a	Seq. ID No. 3321	Seq. ID No. 3322	IM	5
1610a	Seq. ID No. 3327	Seq. ID No. 3328	Cyto	
1610b	Seq. ID No. 3329	Seq. ID No. 3330	Cyto	
1616a	Seq. ID No. 3333	Seq. ID No. 3334	IM	1
1622a	Seq. ID No. 3341	Seq. ID No. 3342	Cyto	0

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1623a	Seq. ID No. 3343	Seq. ID No. 3344	Cyto	
1623b	Seq. ID No. 3345	Seq. ID No. 3346	Cyto	
1623c	Seq. ID No. 3347	Seq. ID No. 3348	Cyto	
1628a	Seq. ID No. 3361	Seq. ID No. 3362	Cyto	
1628b	Seq. ID No. 3363	Seq. ID No. 3364	Cyto	
1632a	Seq. ID No. 3365	Seq. ID No. 3366	Cyto	0
1632b	Seq. ID No. 3367	Seq. ID No. 3368	Cyto	0
1633a	Seq. ID No. 3369	Seq. ID No. 3370	IM	2
1633b	Seq. ID No. 3371	Seq. ID No. 3372	IM	2
1634a	Seq. ID No. 3373	Seq. ID No. 3374	Cyto	
1639b	Seq. ID No. 3379	Seq. ID No. 3380	Cyto	
1642a	Seq. ID No. 3381	Seq. ID No. 3382	Cyto	1
1642b	Seq. ID No. 3383	Seq. ID No. 3384	Cyto	1
1643a	Seq. ID No. 3385	Seq. ID No. 3386	Cyto	
1643b	Seq. ID No. 3387	Seq. ID No. 3388	Cyto	
1646c	Seq. ID No. 3393	Seq. ID No. 3394	IM	11
1646e	Seq. ID No. 3397	Seq. ID No. 3398	IM	13
1646f	Seq. ID No. 3399	Seq. ID No. 3400	IM	13
1647	Seq. ID No. 3401	Seq. ID No. 3402	Cyto	
1648b	Seq. ID No. 3403	Seq. ID No. 3404	IM	3
1649b	Seq. ID No. 3407	Seq. ID No. 3408	Cyto	2
1649c	Seq. ID No. 3409	Seq. ID No. 3410	Cyto	2
1652a	Seq. ID No. 3411	Seq. ID No. 3412	Cyto	
1652b	Seq. ID No. 3413	Seq. ID No. 3414	Cyto	
1656b	Seq. ID No. 3417	Seq. ID No. 3418	Cyto	
1657	Seq. ID No. 3419	Seq. ID No. 3420	Cyto	
1659b	Seq. ID No. 3423	Seq. ID No. 3424	IM	9
1662a	Seq. ID No. 3429	Seq. ID No. 3430	Cyto	1
1662b	Seq. ID No. 3431	Seq. ID No. 3432	Cyto	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1664	Seq. ID No. 3435	Seq. ID No. 3436	IM	0
1665a	Seq. ID No. 3437	Seq. ID No. 3438	Cyto	1
1668	Seq. ID No. 3439	Seq. ID No. 3440	IM	1
1670a	Seq. ID No. 3443	Seq. ID No. 3444	Cyto	
1670b	Seq. ID No. 3445	Seq. ID No. 3446	Cyto	
1670c	Seq. ID No. 3447	Seq. ID No. 3448	IM	
1673f	Seq. ID No. 3459	Seq. ID No. 3460	IM	14
1674	Seq. ID No. 3461	Seq. ID No. 3462	OM	1
1675b	Seq. ID No. 3465	Seq. ID No. 3466	Cyto	1
1675c	Seq. ID No. 3467	Seq. ID No. 3468	Cyto	1
1676	Seq. ID No. 3469	Seq. ID No. 3470	Cyto	1
1677	Seq. ID No. 3471	Seq. ID No. 3472	Cyto	0
1679	Seq. ID No. 3473	Seq. ID No. 3474	IM	1
1680	Seq. ID No. 3475	Seq. ID No. 3476	IM	
1682a	Seq. ID No. 3477	Seq. ID No. 3478	Cyto	
1682b	Seq. ID No. 3479	Seq. ID No. 3480	Cyto	
1683b	Seq. ID No. 3483	Seq. ID No. 3484	IM	6
1684	Seq. ID No. 3485	Seq. ID No. 3486	Cyto	
1685	Seq. ID No. 3487	Seq. ID No. 3488	Cyto	0
1687	Seq. ID No. 3489	Seq. ID No. 3490	Cyto	0
1688c	Seq. ID No. 3495	Seq. ID No. 3496	IM	11
1689a	Seq. ID No. 3497	Seq. ID No. 3498	IM	
1689b	Seq. ID No. 3499	Seq. ID No. 3500	IM	
1689c	Seq. ID No. 3501	Seq. ID No. 3502	Cyto	
1691	Seq. ID No. 3507	Seq. ID No. 3508	IM	9
1692	Seq. ID No. 3509	Seq. ID No. 3510	Cyto	
1693	Seq. ID No. 3511	Seq. ID No. 3512	IM	
1694a	Seq. ID No. 3513	Seq. ID No. 3514	Cyto	
1694b	Seq. ID No. 3515	Seq. ID No. 3516	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1696	Seq. ID No. 3521	Seq. ID No. 3522	Peri	1
1697a	Seq. ID No. 3523	Seq. ID No. 3524	IM	7
1697b	Seq. ID No. 3525	Seq. ID No. 3526	IM	9
1699b	Seq. ID No. 3529	Seq. ID No. 3530	IM	10
1700b	Seq. ID No. 3533	Seq. ID No. 3534	IM	4
1701a	Seq. ID No. 3535	Seq. ID No. 3536	Cyto	0
1701b	Seq. ID No. 3537	Seq. ID No. 3538	Cyto	0
1704a	Seq. ID No. 3541	Seq. ID No. 3542	IM	0
1704b	Seq. ID No. 3543	Seq. ID No. 3544	Cyto	0
1705a	Seq. ID No. 3545	Seq. ID No. 3546	Cyto	
1705b	Seq. ID No. 3547	Seq. ID No. 3548	Cyto	
1706	Seq. ID No. 3549	Seq. ID No. 3550	Cyto	
1707a	Seq. ID No. 3551	Seq. ID No. 3552	Cyto	
1707b	Seq. ID No. 3553	Seq. ID No. 3554	Cyto	
1708	Seq. ID No. 3555	Seq. ID No. 3556	Cyto	0
1709	Seq. ID No. 3557	Seq. ID No. 3558	Cyto	
1710a	Seq. ID No. 3559	Seq. ID No. 3560	Peri	
1712a	Seq. ID No. 3563	Seq. ID No. 3564	Cyto	
1712b	Seq. ID No. 3565	Seq. ID No. 3566	Cyto	
1715a	Seq. ID No. 3567	Seq. ID No. 3568	Cyto	
1715b	Seq. ID No. 3569	Seq. ID No. 3570	Cyto	
1718a	Seq. ID No. 3571	Seq. ID No. 3572	Cyto	
1722	Seq. ID No. 3575	Seq. ID No. 3576	IM	1
1723a	Seq. ID No. 3577	Seq. ID No. 3578	Cyto	0
1723b	Seq. ID No. 3579	Seq. ID No. 3580	Cyto	0
1727	Seq. ID No. 3583	Seq. ID No. 3584	Cyto	0
1728	Seq. ID No. 3585	Seq. ID No. 3586	Cyto	
1733	Seq. ID No. 3589	Seq. ID No. 3590	Cyto	
1734	Seq. ID No. 3591	Seq. ID No. 3592	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1737a	Seq. ID No. 3597	Seq. ID No. 3598	Cyto	
1737b	Seq. ID No. 3599	Seq. ID No. 3600	Cyto	
1738a	Seq. ID No. 3601	Seq. ID No. 3602	Cyto	
1738b	Seq. ID No. 3603	Seq. ID No. 3604	Cyto	0
1738c	Seq. ID No. 3605	Seq. ID No. 3606	Cyto	0
1739	Seq. ID No. 3607	Seq. ID No. 3608	Cyto	
1741	Seq. ID No. 3609	Seq. ID No. 3610	Cyto	
1744a	Seq. ID No. 3613	Seq. ID No. 3614	Cyto	
1744b	Seq. ID No. 3615	Seq. ID No. 3616	Cyto	
1749b	Seq. ID No. 3623	Seq. ID No. 3624	IM	4
1752a	Seq. ID No. 3627	Seq. ID No. 3628	Cyto	
1753	Seq. ID No. 3631	Seq. ID No. 3632	Cyto	
1756a	Seq. ID No. 3633	Seq. ID No. 3634	Cyto	
1757a	Seq. ID No. 3637	Seq. ID No. 3638	IM	2
1757b	Seq. ID No. 3639	Seq. ID No. 3640	IM	2
1759	Seq. ID No. 3641	Seq. ID No. 3642	Cyto	
1760	Seq. ID No. 3643	Seq. ID No. 3644	Cyto	
1762	Seq. ID No. 3645	Seq. ID No. 3646	Cyto	
1764a	Seq. ID No. 3647	Seq. ID No. 3648	IM	
1764b	Seq. ID No. 3649	Seq. ID No. 3650	IM	
1764c	Seq. ID No. 3651	Seq. ID No. 3652	IM	
1765	Seq. ID No. 3653	Seq. ID No. 3654	Cyto	
1766	Seq. ID No. 3655	Seq. ID No. 3656	IM	0
1767a	Seq. ID No. 3657	Seq. ID No. 3658	Cyto	
1767b	Seq. ID No. 3659	Seq. ID No. 3660	Cyto	
1769a	Seq. ID No. 3661	Seq. ID No. 3662	IM	5
1769b	Seq. ID No. 3663	Seq. ID No. 3664	IM	7
1771	Seq. ID No. 3665	Seq. ID No. 3666	Cyto	
1773	Seq. ID No. 3667	Seq. ID No. 3668	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1774	Seq. ID No. 3669	Seq. ID No. 3670	IM	
1775a	Seq. ID No. 3671	Seq. ID No. 3672	Cyto	
1775b	Seq. ID No. 3673	Seq. ID No. 3674	Cyto	
1775c	Seq. ID No. 3675	Seq. ID No. 3676	Cyto	
1780	Seq. ID No. 3681	Seq. ID No. 3682	IM	0
1783a	Seq. ID No. 3683	Seq. ID No. 3684	IM	1
1783b	Seq. ID No. 3685	Seq. ID No. 3686	IM	1
1784a	Seq. ID No. 3687	Seq. ID No. 3688	IM	
1788a	Seq. ID No. 3691	Seq. ID No. 3692	Cyto	
1788b	Seq. ID No. 3693	Seq. ID No. 3694	IM	
1788c	Seq. ID No. 3695	Seq. ID No. 3696	Cyto	
1789a	Seq. ID No. 3697	Seq. ID No. 3698	Cyto	
1789b	Seq. ID No. 3699	Seq. ID No. 3700	Cyto	
1790a	Seq. ID No. 3701	Seq. ID No. 3702	Cyto	2
1790b	Seq. ID No. 3703	Seq. ID No. 3704	Cyto	3
1792a	Seq. ID No. 3705	Seq. ID No. 3706	Peri	0
1792b	Seq. ID No. 3707	Seq. ID No. 3708	Cyto	0
1792c	Seq. ID No. 3709	Seq. ID No. 3710	Cyto	0
1793a	Seq. ID No. 3711	Seq. ID No. 3712	IM	
1793b	Seq. ID No. 3713	Seq. ID No. 3714	IM	
1793c	Seq. ID No. 3715	Seq. ID No. 3716	IM	
1797a	Seq. ID No. 3719	Seq. ID No. 3720	Cyto	
1797b	Seq. ID No. 3721	Seq. ID No. 3722	Cyto	
1798b	Seq. ID No. 3725	Seq. ID No. 3726	IM	4
1800	Seq. ID No. 3729	Seq. ID No. 3730	IM	1
1802a	Seq. ID No. 3731	Seq. ID No. 3732	IM	2
1802b	Seq. ID No. 3733	Seq. ID No. 3734	IM	2
1803	Seq. ID No. 3735	Seq. ID No. 3736	IM	3
1804a	Seq. ID No. 3737	Seq. ID No. 3738	IM	2



TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1804b	Seq. ID No. 3739	Seq. ID No. 3740	IM	2
1806a	Seq. ID No. 3743	Seq. ID No. 3744	IM	5
1806c	Seq. ID No. 3747	Seq. ID No. 3748	IM	5
1807a	Seq. ID No. 3749	Seq. ID No. 3750	IM	2
1807b	Seq. ID No. 3751	Seq. ID No. 3752	IM	2
1808d	Seq. ID No. 3759	Seq. ID No. 3760	IM	15
1809d	Seq. ID No. 3767	Seq. ID No. 3768	IM	12
1809e	Seq. ID No. 3769	Seq. ID No. 3770	IM	14
1809f	Seq. ID No. 3771	Seq. ID No. 3772	IM	14
1810a	Seq. ID No. 3773	Seq. ID No. 3774	Cyto	
1810b	Seq. ID No. 3775	Seq. ID No. 3776	Cyto	
1811a	Seq. ID No. 3777	Seq. ID No. 3778	Cyto	
1811b	Seq. ID No. 3779	Seq. ID No. 3780	Cyto	
1813	Seq. ID No. 3785	Seq. ID No. 3786	IM	1
1815a	Seq. ID No. 3787	Seq. ID No. 3788	Cyto	
1815b	Seq. ID No. 3789	Seq. ID No. 3790	Cyto	
1815c	Seq. ID No. 3791	Seq. ID No. 3792	Cyto	
1816b	Seq. ID No. 3795	Seq. ID No. 3796	IM	1
1816c	Seq. ID No. 3797	Seq. ID No. 3798	IM	1
1819a	Seq. ID No. 3801	Seq. ID No. 3802	IM	0
1819b	Seq. ID No. 3803	Seq. ID No. 3804	IM	0
1821	Seq. ID No. 3805	Seq. ID No. 3806	Cyto	0
1823a	Seq. ID No. 3809	Seq. ID No. 3810	Cyto	
1823b	Seq. ID No. 3811	Seq. ID No. 3812	Cyto	
1828	Seq. ID No. 3819	Seq. ID No. 3820	Cyto	
1830a	Seq. ID No. 3821	Seq. ID No. 3822	IM	6
1830b	Seq. ID No. 3823	Seq. ID No. 3824	IM	7
1833	Seq. ID No. 3825	Seq. ID No. 3826	Cyto	
1834	Seq. ID No. 3827	Seq. ID No. 3828	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1835	Seq. ID No. 3829	Seq. ID No. 3830	Cyto	
1836a	Seq. ID No. 3831	Seq. ID No. 3832	IM	1
1836b	Seq. ID No. 3833	Seq. ID No. 3834	IM	1
1837	Seq. ID No. 3835	Seq. ID No. 3836	IM	
1838c	Seq. ID No. 3841	Seq. ID No. 3842	IM	6
1838d	Seq. ID No. 3843	Seq. ID No. 3844	IM	6
1839a	Seq. ID No. 3845	Seq. ID No. 3846	Cyto	0
1839b	Seq. ID No. 3847	Seq. ID No. 3848	Cyto	0
1842d	Seq. ID No. 3855	Seq. ID No. 3856	IM	10
1843	Seq. ID No. 3857	Seq. ID No. 3858	Cyto	
1848b	Seq. ID No. 3867	Seq. ID No. 3868	IM	10
1850a	Seq. ID No. 3869	Seq. ID No. 3870	IM	1
1850b	Seq. ID No. 3871	Seq. ID No. 3872	IM	1
1850c	Seq. ID No. 3873	Seq. ID No. 3874	IM	1
1853a	Seq. ID No. 3875	Seq. ID No. 3876	IM	0
1853b	Seq. ID No. 3877	Seq. ID No. 3878	IM	0
1854b	Seq. ID No. 3881	Seq. ID No. 3882	IM	4
1855	Seq. ID No. 3883	Seq. ID No. 3884	IM	1
1856	Seq. ID No. 3885	Seq. ID No. 3886	Cyto	
1857a	Seq. ID No. 3887	Seq. ID No. 3888	Cyto	0
1857d	Seq. ID No. 3893	Seq. ID No. 3894	IM	8
1859	Seq. ID No. 3897	Seq. ID No. 3898	Cyto	
1861a	Seq. ID No. 3899	Seq. ID No. 3900	Cyto	
1861b	Seq. ID No. 3901	Seq. ID No. 3902	Cyto	
1863a	Seq. ID No. 3905	Seq. ID No. 3906	Cyto	
1863b	Seq. ID No. 3907	Seq. ID No. 3908	Cyto	0
1864a	Seq. ID No. 3909	Seq. ID No. 3910	Cyto	0
1865a	Seq. ID No. 3911	Seq. ID No. 3912	IM	6
1865b	Seq. ID No. 3913	Seq. ID No. 3914	IM	7

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1869	Seq. ID No. 3917	Seq. ID No. 3918	Cyto	
1870	Seq. ID No. 3919	Seq. ID No. 3920	Cyto	0
1873a	Seq. ID No. 3921	Seq. ID No. 3922	Cyto	
1875b	Seq. ID No. 3927	Seq. ID No. 3928	Cyto	
1875c	Seq. ID No. 3929	Seq. ID No. 3930	IM	1
1877a	Seq. ID No. 3931	Seq. ID No. 3932	Cyto	
1877b	Seq. ID No. 3933	Seq. ID No. 3934	Cyto	
1878	Seq. ID No. 3935	Seq. ID No. 3936	IM	
1879	Seq. ID No. 3937	Seq. ID No. 3938	Cyto	1
1882	Seq. ID No. 3939	Seq. ID No. 3940	IM	2
1884	Seq. ID No. 3941	Seq. ID No. 3942	Cyto	
1886	Seq. ID No. 3943	Seq. ID No. 3944	Cyto	
1887	Seq. ID No. 3945	Seq. ID No. 3946	Cyto	0
1888a	Seq. ID No. 3947	Seq. ID No. 3948	IM	10
1888b	Seq. ID No. 3949	Seq. ID No. 3950	IM	10
1890	Seq. ID No. 3951	Seq. ID No. 3952	Cyto	
1891a	Seq. ID No. 3953	Seq. ID No. 3954	Cyto	
1891b	Seq. ID No. 3955	Seq. ID No. 3956	Cyto	
1893	Seq. ID No. 3957	Seq. ID No. 3958	Cyto	0
1895	Seq. ID No. 3961	Seq. ID No. 3962	IM	0
1896b	Seq. ID No. 3965	Seq. ID No. 3966	IM	2
1897a	Seq. ID No. 3967	Seq. ID No. 3968	Cyto	
1897b	Seq. ID No. 3969	Seq. ID No. 3970	Cyto	
1897c	Seq. ID No. 3971	Seq. ID No. 3972	Cyto	
1899	Seq. ID No. 3977	Seq. ID No. 3978	Cyto	
1900	Seq. ID No. 3979	Seq. ID No. 3980	Cyto	1
1902a	Seq. ID No. 3981	Seq. ID No. 3982	Cyto	0
1902b	Seq. ID No. 3983	Seq. ID No. 3984	Cyto	0
1907	Seq. ID No. 3985	Seq. ID No. 3986	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1912	Seq. ID No. 3987	Seq. ID No. 3988	Cyto	0
1915a	Seq. ID No. 3989	Seq. ID No. 3990	Cyto	
1915b	Seq. ID No. 3991	Seq. ID No. 3992	Cyto	
1918b	Seq. ID No. 3999	Seq. ID No. 4000	IM	0
1918c	Seq. ID No. 4001	Seq. ID No. 4002	IM	0
1918d	Seq. ID No. 4003	Seq. ID No. 4004	IM	0
1923a	Seq. ID No. 4011	Seq. ID No. 4012	Cyto	0
1923b	Seq. ID No. 4013	Seq. ID No. 4014	Cyto	0
1925	Seq. ID No. 4015	Seq. ID No. 4016	Cyto	
1926	Seq. ID No. 4017	Seq. ID No. 4018	Cyto	1
1927a	Seq. ID No. 4019	Seq. ID No. 4020	Cyto	
1927b	Seq. ID No. 4021	Seq. ID No. 4022	Cyto	0
1930	Seq. ID No. 4023	Seq. ID No. 4024	Cyto	
1931c	Seq. ID No. 4029	Seq. ID No. 4030	IM	7
1932	Seq. ID No. 4031	Seq. ID No. 4032	IM	3
1933a	Seq. ID No. 4033	Seq. ID No. 4034	Cyto	1
1933b	Seq. ID No. 4035	Seq. ID No. 4036	Cyto	1
1934	Seq. ID No. 4037	Seq. ID No. 4038	Cyto	
1939a	Seq. ID No. 4051	Seq. ID No. 4052	Cyto	0
1939b	Seq. ID No. 4053	Seq. ID No. 4054	Cyto	0
1939c	Seq. ID No. 4055	Seq. ID No. 4056	IM	0
1940	Seq. ID No. 4057	Seq. ID No. 4058	Cyto	
1941a	Seq. ID No. 4059	Seq. ID No. 4060	IM	2
1942	Seq. ID No. 4063	Seq. ID No. 4064	Cyto	
1943a	Seq. ID No. 4065	Seq. ID No. 4066	Cyto	0
1943b	Seq. ID No. 4067	Seq. ID No. 4068	Cyto	0
1944	Seq. ID No. 4069	Seq. ID No. 4070	IM	1
1946c	Seq. ID No. 4075	Seq. ID No. 4076	IM	10
1949	Seq. ID No. 4077	Seq. ID No. 4078	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1951c	Seq. ID No. 4085	Seq. ID No. 4086	IM	4
1951d	Seq. ID No. 4087	Seq. ID No. 4088	IM	4
1953	Seq. ID No. 4089	Seq. ID No. 4090	IM	1
1954a	Seq. ID No. 4091	Seq. ID No. 4092	IM	0
1954b	Seq. ID No. 4093	Seq. ID No. 4094	IM	0
1954c	Seq. ID No. 4095	Seq. ID No. 4096	IM	0
1956	Seq. ID No. 4097	Seq. ID No. 4098	Cyto	
1957	Seq. ID No. 4099	Seq. ID No. 4100	Cyto	
1958c	Seq. ID No. 4105	Seq. ID No. 4106	IM	9
1960a	Seq. ID No. 4107	Seq. ID No. 4108	Cyto	0
1960b	Seq. ID No. 4109	Seq. ID No. 4110	Cyto	0
1961	Seq. ID No. 4113	Seq. ID No. 4114	IM	1
1962a	Seq. ID No. 4115	Seq. ID No. 4116	Cyto	
1962b	Seq. ID No. 4117	Seq. ID No. 4118	Cyto	
1965a	Seq. ID No. 4119	Seq. ID No. 4120	Cyto	0
1965b	Seq. ID No. 4121	Seq. ID No. 4122	Cyto	0
1966	Seq. ID No. 4123	Seq. ID No. 4124	Cyto	
1967	Seq. ID No. 4125	Seq. ID No. 4126	Cyto	
1968	Seq. ID No. 4127	Seq. ID No. 4128	Cyto	
1969	Seq. ID No. 4129	Seq. ID No. 4130	IM	3
1970a	Seq. ID No. 4131	Seq. ID No. 4132	Cyto	
1979a	Seq. ID No. 4147	Seq. ID No. 4148	Cyto	
1979b	Seq. ID No. 4149	Seq. ID No. 4150	Cyto	
1981	Seq. ID No. 4155	Seq. ID No. 4156	Cyto	1
1982	Seq. ID No. 4157	Seq. ID No. 4158	IM	
1985a	Seq. ID No. 4159	Seq. ID No. 4160	Cyto	
1985b	Seq. ID No. 4161	Seq. ID No. 4162	Cyto	
1986	Seq. ID No. 4163	Seq. ID No. 4164	Cyto	
1987a	Seq. ID No. 4165	Seq. ID No. 4166	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
1987b	Seq. ID No. 4167	Seq. ID No. 4168	Cyto	
1989a	Seq. ID No. 4169	Seq. ID No. 4170	Cyto	
1989b	Seq. ID No. 4171	Seq. ID No. 4172	Cyto	
1989c	Seq. ID No. 4173	Seq. ID No. 4174	Cyto	
1990a	Seq. ID No. 4175	Seq. ID No. 4176	Cyto	
1990b	Seq. ID No. 4177	Seq. ID No. 4178	Cyto	
1990c	Seq. ID No. 4179	Seq. ID No. 4180	Cyto	
1992a	Seq. ID No. 4183	Seq. ID No. 4184	Cyto	
1992b	Seq. ID No. 4185	Seq. ID No. 4186	Cyto	
1993a	Seq. ID No. 4187	Seq. ID No. 4188	Cyto	
1993b	Seq. ID No. 4189	Seq. ID No. 4190	Cyto	
1993c	Seq. ID No. 4191	Seq. ID No. 4192	Cyto	
1996	Seq. ID No. 4193	Seq. ID No. 4194	Cyto	0
2000	Seq. ID No. 4195	Seq. ID No. 4196	IM	
2001	Seq. ID No. 4197	Seq. ID No. 4198	IM	0
2003	Seq. ID No. 4199	Seq. ID No. 4200	Cyto	
2006	Seq. ID No. 4201	Seq. ID No. 4202	Cyto	
2008	Seq. ID No. 4203	Seq. ID No. 4204	IM	2
2010	Seq. ID No. 4205	Seq. ID No. 4206	Cyto	
2011a	Seq. ID No. 4207	Seq. ID No. 4208	Cyto	1
2011b	Seq. ID No. 4209	Seq. ID No. 4210	Cyto	1
2011c	Seq. ID No. 4211	Seq. ID No. 4212	Cyto	1
2013a	Seq. ID No. 4213	Seq. ID No. 4214	Cyto	
2013b	Seq. ID No. 4215	Seq. ID No. 4216	Cyto	
2014c	Seq. ID No. 4217	Seq. ID No. 4218	Cyto	
2015	Seq. ID No. 4219	Seq. ID No. 4220	Cyto	
2016e	Seq. ID No. 4229	Seq. ID No. 4230	IM	12
2016h	Seq. ID No. 4235	Seq. ID No. 4236	IM	13
2020	Seq. ID No. 4237	Seq. ID No. 4238	IM	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2021	Seq. ID No. 4239	Seq. ID No. 4240	IM	2
2023b	Seq. ID No. 4243	Seq. ID No. 4244	IM	7
2024a	Seq. ID No. 4245	Seq. ID No. 4246	Cyto	1
2024c	Seq. ID No. 4249	Seq. ID No. 4250	IM	2
2024d	Seq. ID No. 4251	Seq. ID No. 4252	IM	2
2027	Seq. ID No. 4255	Seq. ID No. 4256	Cyto	0
2033	Seq. ID No. 4267	Seq. ID No. 4268	Cyto	
2036	Seq. ID No. 4271	Seq. ID No. 4272	Cyto	
2037	Seq. ID No. 4273	Seq. ID No. 4274	Cyto	
2040a	Seq. ID No. 4277	Seq. ID No. 4278	IM	3
2042	Seq. ID No. 4279	Seq. ID No. 4280	IM	2
2043b	Seq. ID No. 4281	Seq. ID No. 4282	Cyto	
2044	Seq. ID No. 4283	Seq. ID No. 4284	Cyto	0
2046a	Seq. ID No. 4289	Seq. ID No. 4290	Cyto	
2046b	Seq. ID No. 4291	Seq. ID No. 4292	Cyto	
2047a	Seq. ID No. 4293	Seq. ID No. 4294	IM	0
2047b	Seq. ID No. 4295	Seq. ID No. 4296	IM	0
2050	Seq. ID No. 4299	Seq. ID No. 4300	Cyto	
2053	Seq. ID No. 4301	Seq. ID No. 4302	Peri	
2054	Seq. ID No. 4303	Seq. ID No. 4304	Cyto	
2055	Seq. ID No. 4305	Seq. ID No. 4306	Cyto	
2057	Seq. ID No. 4309	Seq. ID No. 4310	IM	0
2060a	Seq. ID No. 4315	Seq. ID No. 4316	Cyto	
2060b	Seq. ID No. 4317	Seq. ID No. 4318	Cyto	
2062a	Seq. ID No. 4319	Seq. ID No. 4320	Cyto	0
2062b	Seq. ID No. 4321	Seq. ID No. 4322	Cyto	0
2062c	Seq. ID No. 4323	Seq. ID No. 4324	Cyto	0
2064	Seq. ID No. 4325	Seq. ID No. 4326	Cyto	
2065a	Seq. ID No. 4327	Seq. ID No. 4328	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2065b	Seq. ID No. 4329	Seq. ID No. 4330	Cyto	
2066	Seq. ID No. 4331	Seq. ID No. 4332	IM	
2068	Seq. ID No. 4333	Seq. ID No. 4334	Cyto	
2069a	Seq. ID No. 4335	Seq. ID No. 4336	Cyto	
2069b	Seq. ID No. 4337	Seq. ID No. 4338	Cyto	
2069c	Seq. ID No. 4339	Seq. ID No. 4340	Cyto	
2074a	Seq. ID No. 4341	Seq. ID No. 4342	Cyto	
2075a	Seq. ID No. 4345	Seq. ID No. 4346	Cyto	
2075b	Seq. ID No. 4347	Seq. ID No. 4348	Cyto	
2076a	Seq. ID No. 4349	Seq. ID No. 4350	Cyto	
2076b	Seq. ID No. 4351	Seq. ID No. 4352	IM	
2076c	Seq. ID No. 4353	Seq. ID No. 4354	IM	
2078	Seq. ID No. 4355	Seq. ID No. 4356	IM	1
2079a	Seq. ID No. 4357	Seq. ID No. 4358	IM	1
2079b	Seq. ID No. 4359	Seq. ID No. 4360	IM	1
2079c	Seq. ID No. 4361	Seq. ID No. 4362	IM	1
2081a	Seq. ID No. 4363	Seq. ID No. 4364	Cyto	
2081b	Seq. ID No. 4365	Seq. ID No. 4366	Cyto	
2086a	Seq. ID No. 4367	Seq. ID No. 4368	Cyto	
2086b	Seq. ID No. 4369	Seq. ID No. 4370	Cyto	
2087a	Seq. ID No. 4371	Seq. ID No. 4372	Cyto	
2087b	Seq. ID No. 4373	Seq. ID No. 4374	Cyto	
2088	Seq. ID No. 4375	Seq. ID No. 4376	IM	1
2091	Seq. ID No. 4377	Seq. ID No. 4378	Cyto	
2093a	Seq. ID No. 4381	Seq. ID No. 4382	Cyto	
2094	Seq. ID No. 4383	Seq. ID No. 4384	Cyto	
2096b	Seq. ID No. 4387	Seq. ID No. 4388	IM	9
2097	Seq. ID No. 4393	Seq. ID No. 4394	Cyto	0
2098b	Seq. ID No. 4395	Seq. ID No. 4396	IM	1



TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2100	Seq. ID No. 4397	Seq. ID No. 4398	Cyto	1
2104	Seq. ID No. 4401	Seq. ID No. 4402	IM	1
2107a	Seq. ID No. 4405	Seq. ID No. 4406	Cyto	0
2107b	Seq. ID No. 4407	Seq. ID No. 4408	Cyto	0
2109a	Seq. ID No. 4409	Seq. ID No. 4410	Cyto	
2109b	Seq. ID No. 4411	Seq. ID No. 4412	Cyto	
2110a	Seq. ID No. 4413	Seq. ID No. 4414	Cyto	1
2110b	Seq. ID No. 4415	Seq. ID No. 4416	Cyto	1
2110c	Seq. ID No. 4417	Seq. ID No. 4418	Cyto	1
2112a	Seq. ID No. 4419	Seq. ID No. 4420	Cyto	1
2112b	Seq. ID No. 4421	Seq. ID No. 4422	Cyto	1
2112c	Seq. ID No. 4423	Seq. ID No. 4424	IM	1
2114b	Seq. ID No. 4425	Seq. ID No. 4426	IM	1
2115a	Seq. ID No. 4427	Seq. ID No. 4428	Cyto	
2115b	Seq. ID No. 4429	Seq. ID No. 4430	Cyto	
2115c	Seq. ID No. 4431	Seq. ID No. 4432	IM	
2116	Seq. ID No. 4433	Seq. ID No. 4434	Cyto	
2117	Seq. ID No. 4435	Seq. ID No. 4436	Cyto	0
2123	Seq. ID No. 4443	Seq. ID No. 4444	Cyto	
2124a	Seq. ID No. 4445	Seq. ID No. 4446	Cyto	
2124b	Seq. ID No. 4447	Seq. ID No. 4448	Cyto	
2125a	Seq. ID No. 4449	Seq. ID No. 4450	Cyto	
2125b	Seq. ID No. 4451	Seq. ID No. 4452	Cyto	
2127a	Seq. ID No. 4453	Seq. ID No. 4454	IM	1
2127b	Seq. ID No. 4455	Seq. ID No. 4456	IM	1
2128a	Seq. ID No. 4457	Seq. ID No. 4458	Cyto	
2128b	Seq. ID No. 4459	Seq. ID No. 4460	Cyto	
2133	Seq. ID No. 4461	Seq. ID No. 4462	Cyto	0
2138a	Seq. ID No. 4463	Seq. ID No. 4464	Cyto	0

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2138b	Seq. ID No. 4465	Seq. ID No. 4466	Cyto	0
2138c	Seq. ID No. 4467	Seq. ID No. 4468	Cyto	0
2140b	Seq. ID No. 4471	Seq. ID No. 4472	IM	5
2142b	Seq. ID No. 4475	Seq. ID No. 4476	IM	7
2144a	Seq. ID No. 4477	Seq. ID No. 4478	Cyto	
2144b	Seq. ID No. 4479	Seq. ID No. 4480	Cyto	
2147c	Seq. ID No. 4487	Seq. ID No. 4488	IM	5
2149a	Seq. ID No. 4489	Seq. ID No. 4490	Cyto	
2149b	Seq. ID No. 4491	Seq. ID No. 4492	Cyto	
2152a	Seq. ID No. 4499	Seq. ID No. 4500	Cyto	
2153	Seq. ID No. 4501	Seq. ID No. 4502	Cyto	
2155a	Seq. ID No. 4503	Seq. ID No. 4504	Cyto	0
2155b	Seq. ID No. 4505	Seq. ID No. 4506	Cyto	0
2156a	Seq. ID No. 4507	Seq. ID No. 4508	Cyto	
2156b	Seq. ID No. 4509	Seq. ID No. 4510	Cyto	
2156c	Seq. ID No. 4511	Seq. ID No. 4512	Cyto	
2160a	Seq. ID No. 4517	Seq. ID No. 4518	Cyto	
2160b	Seq. ID No. 4519	Seq. ID No. 4520	Cyto	
2160c	Seq. ID No. 4521	Seq. ID No. 4522	Cyto	
2160d	Seq. ID No. 4523	Seq. ID No. 4524	Cyto	
2161a	Seq. ID No. 4525	Seq. ID No. 4526	Cyto	1
2164	Seq. ID No. 4531	Seq. ID No. 4532	IM	0
2166a	Seq. ID No. 4535	Seq. ID No. 4536	Cyto	1
2166b	Seq. ID No. 4537	Seq. ID No. 4538	Cyto	2
2169	Seq. ID No. 4539	Seq. ID No. 4540	Cyto	
2171	Seq. ID No. 4541	Seq. ID No. 4542	Cyto	0
2172	Seq. ID No. 4543	Seq. ID No. 4544	Cyto	
2173a	Seq. ID No. 4545	Seq. ID No. 4546	Cyto	0
2173b	Seq. ID No. 4547	Seq. ID No. 4548	Cyto	0

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2174	Seq. ID No. 4549	Seq. ID No. 4550	IM	0
2175	Seq. ID No. 4551	Seq. ID No. 4552	IM	2
2176a	Seq. ID No. 4553	Seq. ID No. 4554	Cyto	0
2176b	Seq. ID No. 4555	Seq. ID No. 4556	IM	1
2176c	Seq. ID No. 4557	Seq. ID No. 4558	Cyto	1
2176d	Seq. ID No. 4559	Seq. ID No. 4560	Cyto	1
2177b	Seq. ID No. 4561	Seq. ID No. 4562	IM	1
2179a	Seq. ID No. 4563	Seq. ID No. 4564	Cyto	0
2179b	Seq. ID No. 4565	Seq. ID No. 4566	Cyto	0
2180	Seq. ID No. 4567	Seq. ID No. 4568	Cyto	0
2181a	Seq. ID No. 4569	Seq. ID No. 4570	Cyto	0
2181b	Seq. ID No. 4571	Seq. ID No. 4572	Cyto	0
2182	Seq. ID No. 4573	Seq. ID No. 4574	IM	1
2183	Seq. ID No. 4575	Seq. ID No. 4576	Cyto	
2185	Seq. ID No. 4577	Seq. ID No. 4578	Cyto	
2186a	Seq. ID No. 4579	Seq. ID No. 4580	Cyto	
2186b	Seq. ID No. 4581	Seq. ID No. 4582	Cyto	
2189a	Seq. ID No. 4583	Seq. ID No. 4584	Cyto	
2189b	Seq. ID No. 4585	Seq. ID No. 4586	Cyto	
2193	Seq. ID No. 4591	Seq. ID No. 4592	Cyto	
2194a	Seq. ID No. 4593	Seq. ID No. 4594	Cyto	
2194c	Seq. ID No. 4595	Seq. ID No. 4596	Cyto	
2196	Seq. ID No. 4597	Seq. ID No. 4598	Cyto	
2197a	Seq. ID No. 4599	Seq. ID No. 4600	Cyto	
2197b	Seq. ID No. 4601	Seq. ID No. 4602	Cyto	
2197c	Seq. ID No. 4603	Seq. ID No. 4604	Cyto	
2201a	Seq. ID No. 4605	Seq. ID No. 4606	Cyto	0
2201b	Seq. ID No. 4607	Seq. ID No. 4608	Cyto	0
2203	Seq. ID No. 4609	Seq. ID No. 4610	Cyto	

**TABLE 6: SIGNALP: NON-SECRETORY**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>PSORT</b>	<b>MSD</b>
2204	Seq. ID No. 4611	Seq. ID No. 4612	Cyto	0
2206a	Seq. ID No. 4613	Seq. ID No. 4614	Cyto	
2206b	Seq. ID No. 4615	Seq. ID No. 4616	Cyto	
2208a	Seq. ID No. 4617	Seq. ID No. 4618	Cyto	0
2208b	Seq. ID No. 4619	Seq. ID No. 4620	Cyto	0
2208c	Seq. ID No. 4621	Seq. ID No. 4622	Cyto	0
2209	Seq. ID No. 4623	Seq. ID No. 4624	Cyto	
2212a	Seq. ID No. 4625	Seq. ID No. 4626	IM	1
2212b	Seq. ID No. 4627	Seq. ID No. 4628	IM	1
2215a	Seq. ID No. 4629	Seq. ID No. 4630	Cyto	0
2215b	Seq. ID No. 4631	Seq. ID No. 4632	Cyto	0
2216a	Seq. ID No. 4633	Seq. ID No. 4634	Cyto	
2216b	Seq. ID No. 4635	Seq. ID No. 4636	Cyto	
2218	Seq. ID No. 4637	Seq. ID No. 4638	Cyto	1
2220a	Seq. ID No. 4645	Seq. ID No. 4646	Cyto	
2220b	Seq. ID No. 4647	Seq. ID No. 4648	Cyto	
2220c	Seq. ID No. 4649	Seq. ID No. 4650	Cyto	
2221	Seq. ID No. 4651	Seq. ID No. 4652	Cyto	
2222	Seq. ID No. 4653	Seq. ID No. 4654	Cyto	0
2223a	Seq. ID No. 4655	Seq. ID No. 4656	Cyto	
2223b	Seq. ID No. 4657	Seq. ID No. 4658	Cyto	
2226	Seq. ID No. 4661	Seq. ID No. 4662	Cyto	0
2227	Seq. ID No. 4663	Seq. ID No. 4664	Cyto	
2228a	Seq. ID No. 4665	Seq. ID No. 4666	Cyto	
2228b	Seq. ID No. 4667	Seq. ID No. 4668	Cyto	
2228c	Seq. ID No. 4669	Seq. ID No. 4670	Cyto	
2231	Seq. ID No. 4671	Seq. ID No. 4672	Cyto	
2232	Seq. ID No. 4673	Seq. ID No. 4674	Cyto	
2234a	Seq. ID No. 4675	Seq. ID No. 4676	IM	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2234b	Seq. ID No. 4677	Seq. ID No. 4678	IM	1
2234c	Seq. ID No. 4679	Seq. ID No. 4680	IM	1
2236b	Seq. ID No. 4683	Seq. ID No. 4684	IM	4
2238	Seq. ID No. 4685	Seq. ID No. 4686	Cyto	
2240a	Seq. ID No. 4689	Seq. ID No. 4690	Cyto	0
2240b	Seq. ID No. 4691	Seq. ID No. 4692	Cyto	1
2240c	Seq. ID No. 4693	Seq. ID No. 4694	Cyto	1
2244	Seq. ID No. 4697	Seq. ID No. 4698	Cyto	
2245	Seq. ID No. 4699	Seq. ID No. 4700	OM	1
2246	Seq. ID No. 4701	Seq. ID No. 4702	IM	
2248	Seq. ID No. 4703	Seq. ID No. 4704	Cyto	
2253d	Seq. ID No. 4713	Seq. ID No. 4714	IM	7
2256	Seq. ID No. 4719	Seq. ID No. 4720	Cyto	
2257	Seq. ID No. 4721	Seq. ID No. 4722	IM	0
2259a	Seq. ID No. 4723	Seq. ID No. 4724	Cyto	
2259b	Seq. ID No. 4725	Seq. ID No. 4726	Cyto	
2260b	Seq. ID No. 4727	Seq. ID No. 4728	IM	
2260c	Seq. ID No. 4729	Seq. ID No. 4730	IM	
2262	Seq. ID No. 4731	Seq. ID No. 4732	Cyto	
2263	Seq. ID No. 4733	Seq. ID No. 4734	Cyto	1
2264a	Seq. ID No. 4735	Seq. ID No. 4736	Peri	1
2267	Seq. ID No. 4739	Seq. ID No. 4740	Cyto	0
2268	Seq. ID No. 4741	Seq. ID No. 4742	Cyto	0
2269	Seq. ID No. 4743	Seq. ID No. 4744	Cyto	
2270	Seq. ID No. 4745	Seq. ID No. 4746	IM	1
2272	Seq. ID No. 4747	Seq. ID No. 4748	Cyto	1
2273	Seq. ID No. 4749	Seq. ID No. 4750	Cyto	
2274	Seq. ID No. 4751	Seq. ID No. 4752	Cyto	
2275a	Seq. ID No. 4753	Seq. ID No. 4754	IM	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2275b	Seq. ID No. 4755	Seq. ID No. 4756	IM	1
2275c	Seq. ID No. 4757	Seq. ID No. 4758	IM	1
2276b	Seq. ID No. 4761	Seq. ID No. 4762	Cyto	1
2276c	Seq. ID No. 4763	Seq. ID No. 4764	Cyto	1
2276d	Seq. ID No. 4765	Seq. ID No. 4766	Cyto	1
2277a	Seq. ID No. 4767	Seq. ID No. 4768	Cyto	1
2277b	Seq. ID No. 4769	Seq. ID No. 4770	Cyto	1
2278a	Seq. ID No. 4771	Seq. ID No. 4772	Cyto	
2278b	Seq. ID No. 4773	Seq. ID No. 4774	Cyto	
2278c	Seq. ID No. 4775	Seq. ID No. 4776	Cyto	0
2278d	Seq. ID No. 4777	Seq. ID No. 4778	Cyto	0
2280	Seq. ID No. 4779	Seq. ID No. 4780	Cyto	
2284	Seq. ID No. 4781	Seq. ID No. 4782	Cyto	0
2285	Seq. ID No. 4783	Seq. ID No. 4784	Cyto	
2286a	Seq. ID No. 4785	Seq. ID No. 4786	Cyto	
2286b	Seq. ID No. 4787	Seq. ID No. 4788	Cyto	
2288	Seq. ID No. 4789	Seq. ID No. 4790	Peri	1
2290	Seq. ID No. 4791	Seq. ID No. 4792	Cyto	
2291a	Seq. ID No. 4793	Seq. ID No. 4794	Cyto	
2291b	Seq. ID No. 4795	Seq. ID No. 4796	Cyto	
2291c	Seq. ID No. 4797	Seq. ID No. 4798	Cyto	
2292a	Seq. ID No. 4799	Seq. ID No. 4800	Cyto	0
2292b	Seq. ID No. 4801	Seq. ID No. 4802	Cyto	0
2292c	Seq. ID No. 4803	Seq. ID No. 4804	Cyto	0
2294	Seq. ID No. 4805	Seq. ID No. 4806	Cyto	
2297	Seq. ID No. 4807	Seq. ID No. 4808	Cyto	
2298	Seq. ID No. 4809	Seq. ID No. 4810	Cyto	
2299	Seq. ID No. 4811	Seq. ID No. 4812	Cyto	
2301	Seq. ID No. 4815	Seq. ID No. 4816	IM	7

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2302	Seq. ID No. 4817	Seq. ID No. 4818	IM	1
2303	Seq. ID No. 4819	Seq. ID No. 4820	IM	1
2304	Seq. ID No. 4821	Seq. ID No. 4822	Cyto	
2306c	Seq. ID No. 4823	Seq. ID No. 4824	Cyto	
2307	Seq. ID No. 4825	Seq. ID No. 4826	IM	4
2309a	Seq. ID No. 4829	Seq. ID No. 4830	IM	2
2309b	Seq. ID No. 4831	Seq. ID No. 4832	IM	2
2309c	Seq. ID No. 4833	Seq. ID No. 4834	IM	2
2310	Seq. ID No. 4835	Seq. ID No. 4836	IM	2
2311	Seq. ID No. 4837	Seq. ID No. 4838	Cyto	
2312a	Seq. ID No. 4839	Seq. ID No. 4840	Cyto	
2312b	Seq. ID No. 4841	Seq. ID No. 4842	Cyto	
2312c	Seq. ID No. 4843	Seq. ID No. 4844	Cyto	
2314	Seq. ID No. 4845	Seq. ID No. 4846	Cyto	0
2315	Seq. ID No. 4847	Seq. ID No. 4848	Cyto	
2316	Seq. ID No. 4849	Seq. ID No. 4850	Cyto	1
2317	Seq. ID No. 4851	Seq. ID No. 4852	IM	2
2321a	Seq. ID No. 4855	Seq. ID No. 4856	Cyto	
2321b	Seq. ID No. 4857	Seq. ID No. 4858	Cyto	
2321c	Seq. ID No. 4859	Seq. ID No. 4860	Cyto	
2322	Seq. ID No. 4861	Seq. ID No. 4862	IM	0
2327	Seq. ID No. 4865	Seq. ID No. 4866	Cyto	
2328	Seq. ID No. 4867	Seq. ID No. 4868	Cyto	
2330	Seq. ID No. 4877	Seq. ID No. 4878	Cyto	
2331	Seq. ID No. 4879	Seq. ID No. 4880	IM	1
2333	Seq. ID No. 4881	Seq. ID No. 4882	Cyto	
2335	Seq. ID No. 4883	Seq. ID No. 4884	Cyto	
2336	Seq. ID No. 4885	Seq. ID No. 4886	Cyto	
2337b	Seq. ID No. 4887	Seq. ID No. 4888	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2338a	Seq. ID No. 4889	Seq. ID No. 4890	Cyto	
2338b	Seq. ID No. 4891	Seq. ID No. 4892	Cyto	
2338c	Seq. ID No. 4893	Seq. ID No. 4894	Cyto	
2342a	Seq. ID No. 4895	Seq. ID No. 4896	Cyto	
2342b	Seq. ID No. 4897	Seq. ID No. 4898	Cyto	
2342c	Seq. ID No. 4899	Seq. ID No. 4900	Cyto	
2344	Seq. ID No. 4901	Seq. ID No. 4902	IM	0
2345	Seq. ID No. 4903	Seq. ID No. 4904	Cyto	0
2347	Seq. ID No. 4905	Seq. ID No. 4906	Cyto	1
2348	Seq. ID No. 4907	Seq. ID No. 4908	Cyto	0
2349a	Seq. ID No. 4909	Seq. ID No. 4910	Cyto	
2349b	Seq. ID No. 4911	Seq. ID No. 4912	Cyto	
2350a	Seq. ID No. 4913	Seq. ID No. 4914	Cyto	
2353	Seq. ID No. 4915	Seq. ID No. 4916	Cyto	
2354	Seq. ID No. 4917	Seq. ID No. 4918	Cyto	
2361a	Seq. ID No. 4925	Seq. ID No. 4926	Cyto	
2361b	Seq. ID No. 4927	Seq. ID No. 4928	Cyto	
2365a	Seq. ID No. 4933	Seq. ID No. 4934	Cyto	0
2365b	Seq. ID No. 4935	Seq. ID No. 4936	Cyto	0
2366a	Seq. ID No. 4937	Seq. ID No. 4938	Cyto	
2366b	Seq. ID No. 4939	Seq. ID No. 4940	Cyto	
2367	Seq. ID No. 4941	Seq. ID No. 4942	Cyto	
2368	Seq. ID No. 4943	Seq. ID No. 4944	Cyto	
2369	Seq. ID No. 4945	Seq. ID No. 4946	Cyto	
2370	Seq. ID No. 4947	Seq. ID No. 4948	IM	1
2373	Seq. ID No. 4953	Seq. ID No. 4954	Cyto	
2374a	Seq. ID No. 4955	Seq. ID No. 4956	Cyto	0
2374b	Seq. ID No. 4957	Seq. ID No. 4958	Cyto	0
2376	Seq. ID No. 4959	Seq. ID No. 4960	IM	



**TABLE 6: SIGNALP: NON-SECRETORY**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>PSORT</b>	<b>MSD</b>
2377a	Seq. ID No. 4961	Seq. ID No. 4962	Cyto	
2377b	Seq. ID No. 4963	Seq. ID No. 4964	IM	1
2378	Seq. ID No. 4965	Seq. ID No. 4966	Cyto	
2379a	Seq. ID No. 4967	Seq. ID No. 4968	Cyto	
2379b	Seq. ID No. 4969	Seq. ID No. 4970	Cyto	
2380	Seq. ID No. 4971	Seq. ID No. 4972	Cyto	
2381	Seq. ID No. 4973	Seq. ID No. 4974	Cyto	
2384a	Seq. ID No. 4977	Seq. ID No. 4978	Cyto	0
2384b	Seq. ID No. 4979	Seq. ID No. 4980	Cyto	0
2386b	Seq. ID No. 4981	Seq. ID No. 4982	IM	0
2386c	Seq. ID No. 4983	Seq. ID No. 4984	IM	0
2387	Seq. ID No. 4985	Seq. ID No. 4986	IM	5
2391	Seq. ID No. 4989	Seq. ID No. 4990	IM	0
2392	Seq. ID No. 4991	Seq. ID No. 4992	Cyto	1
2394	Seq. ID No. 4993	Seq. ID No. 4994	IM	1
2395	Seq. ID No. 4995	Seq. ID No. 4996	IM	
2396	Seq. ID No. 4997	Seq. ID No. 4998	Cyto	0
2398	Seq. ID No. 5001	Seq. ID No. 5002	Cyto	
2399a	Seq. ID No. 5003	Seq. ID No. 5004	Cyto	
2399b	Seq. ID No. 5005	Seq. ID No. 5006	Cyto	
2399c	Seq. ID No. 5007	Seq. ID No. 5008	Cyto	
2401	Seq. ID No. 5009	Seq. ID No. 5010	Cyto	
2402a	Seq. ID No. 5011	Seq. ID No. 5012	IM	1
2403a	Seq. ID No. 5015	Seq. ID No. 5016	Cyto	0
2403b	Seq. ID No. 5017	Seq. ID No. 5018	Cyto	0
2404a	Seq. ID No. 5019	Seq. ID No. 5020	Cyto	0
2404b	Seq. ID No. 5021	Seq. ID No. 5022	Cyto	0
2407a	Seq. ID No. 5023	Seq. ID No. 5024	IM	0
2409a	Seq. ID No. 5025	Seq. ID No. 5026	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2409b	Seq. ID No. 5027	Seq. ID No. 5028	Cyto	
2410	Seq. ID No. 5029	Seq. ID No. 5030	Cyto	0
2413a	Seq. ID No. 5033	Seq. ID No. 5034	Cyto	0
2413b	Seq. ID No. 5035	Seq. ID No. 5036	Peri	0
2415a	Seq. ID No. 5037	Seq. ID No. 5038	Cyto	
2415b	Seq. ID No. 5039	Seq. ID No. 5040	IM	
2416b	Seq. ID No. 5041	Seq. ID No. 5042	OM	1
2416c	Seq. ID No. 5043	Seq. ID No. 5044	IM	1
2417a	Seq. ID No. 5045	Seq. ID No. 5046	Cyto	1
2417b	Seq. ID No. 5047	Seq. ID No. 5048	Cyto	1
2418a	Seq. ID No. 5049	Seq. ID No. 5050	Cyto	
2418b	Seq. ID No. 5051	Seq. ID No. 5052	Cyto	
2420	Seq. ID No. 5053	Seq. ID No. 5054	Cyto	0
2421	Seq. ID No. 5055	Seq. ID No. 5056	Cyto	
2422b	Seq. ID No. 5057	Seq. ID No. 5058	Cyto	
2422c	Seq. ID No. 5059	Seq. ID No. 5060	Cyto	
2424a	Seq. ID No. 5065	Seq. ID No. 5066	Cyto	1
2424b	Seq. ID No. 5067	Seq. ID No. 5068	Cyto	1
2426	Seq. ID No. 5071	Seq. ID No. 5072	Cyto	
2428a	Seq. ID No. 5073	Seq. ID No. 5074	IM	3
2428b	Seq. ID No. 5075	Seq. ID No. 5076	IM	3
2428c	Seq. ID No. 5077	Seq. ID No. 5078	IM	3
2429	Seq. ID No. 5079	Seq. ID No. 5080	Cyto	
2432	Seq. ID No. 5081	Seq. ID No. 5082	Cyto	0
2433	Seq. ID No. 5083	Seq. ID No. 5084	IM	1
2440	Seq. ID No. 5087	Seq. ID No. 5088	Cyto	0
2442a	Seq. ID No. 5089	Seq. ID No. 5090	Cyto	
2442b	Seq. ID No. 5091	Seq. ID No. 5092	Cyto	
2443	Seq. ID No. 5093	Seq. ID No. 5094	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2444a	Seq. ID No. 5095	Seq. ID No. 5096	Cyto	
2444b	Seq. ID No. 5097	Seq. ID No. 5098	Cyto	
2444c	Seq. ID No. 5099	Seq. ID No. 5100	Cyto	
2444d	Seq. ID No. 5101	Seq. ID No. 5102	Cyto	
2448b	Seq. ID No. 5105	Seq. ID No. 5106	Cyto	
2449a	Seq. ID No. 5107	Seq. ID No. 5108	Cyto	
2449b	Seq. ID No. 5109	Seq. ID No. 5110	Cyto	
2451	Seq. ID No. 5111	Seq. ID No. 5112	Cyto	
2452	Seq. ID No. 5113	Seq. ID No. 5114	IM	0
2455	Seq. ID No. 5117	Seq. ID No. 5118	Cyto	
2456a	Seq. ID No. 5119	Seq. ID No. 5120	IM	4
2456b	Seq. ID No. 5121	Seq. ID No. 5122	IM	5
2456e	Seq. ID No. 5127	Seq. ID No. 5128	IM	9
2461a	Seq. ID No. 5143	Seq. ID No. 5144	Cyto	
2461b	Seq. ID No. 5145	Seq. ID No. 5146	Cyto	
2462a	Seq. ID No. 5147	Seq. ID No. 5148	Cyto	0
2462b	Seq. ID No. 5149	Seq. ID No. 5150	Cyto	0
2463a	Seq. ID No. 5151	Seq. ID No. 5152	IM	1
2464	Seq. ID No. 5153	Seq. ID No. 5154	IM	1
2465a	Seq. ID No. 5155	Seq. ID No. 5156	Cyto	
2465b	Seq. ID No. 5157	Seq. ID No. 5158	Cyto	
2468b	Seq. ID No. 5161	Seq. ID No. 5162	IM	1
2469a	Seq. ID No. 5163	Seq. ID No. 5164	Cyto	
2470	Seq. ID No. 5167	Seq. ID No. 5168	Cyto	0
2471	Seq. ID No. 5169	Seq. ID No. 5170	Cyto	
2473	Seq. ID No. 5171	Seq. ID No. 5172	Cyto	
2474a	Seq. ID No. 5173	Seq. ID No. 5174	IM	3
2474c	Seq. ID No. 5177	Seq. ID No. 5178	IM	3
2475a	Seq. ID No. 5179	Seq. ID No. 5180	IM	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2475b	Seq. ID No. 5181	Seq. ID No. 5182	IM	1
2475c	Seq. ID No. 5183	Seq. ID No. 5184	IM	1
2477	Seq. ID No. 5185	Seq. ID No. 5186	Cyto	
2480	Seq. ID No. 5187	Seq. ID No. 5188	Cyto	
2481a	Seq. ID No. 5189	Seq. ID No. 5190	IM	0
2481b	Seq. ID No. 5191	Seq. ID No. 5192	IM	1
2482	Seq. ID No. 5193	Seq. ID No. 5194	IM	2
2483	Seq. ID No. 5195	Seq. ID No. 5196	Cyto	
2485	Seq. ID No. 5201	Seq. ID No. 5202	Cyto	1
2489	Seq. ID No. 5203	Seq. ID No. 5204	Cyto	1
2492b	Seq. ID No. 5209	Seq. ID No. 5210	IM	1
2494	Seq. ID No. 5211	Seq. ID No. 5212	IM	0
2495b	Seq. ID No. 5215	Seq. ID No. 5216	IM	10
2497a	Seq. ID No. 5217	Seq. ID No. 5218	IM	1
2498b	Seq. ID No. 5221	Seq. ID No. 5222	IM	1
2500b	Seq. ID No. 5225	Seq. ID No. 5226	IM	1
2500c	Seq. ID No. 5227	Seq. ID No. 5228	IM	1
2501a	Seq. ID No. 5229	Seq. ID No. 5230	Cyto	
2501b	Seq. ID No. 5231	Seq. ID No. 5232	Cyto	
2504a	Seq. ID No. 5233	Seq. ID No. 5234	Cyto	
2504b	Seq. ID No. 5235	Seq. ID No. 5236	Cyto	
2505	Seq. ID No. 5237	Seq. ID No. 5238	IM	3
2506	Seq. ID No. 5239	Seq. ID No. 5240	Cyto	
2507b	Seq. ID No. 5241	Seq. ID No. 5242	Cyto	
2507c	Seq. ID No. 5243	Seq. ID No. 5244	Cyto	
2510	Seq. ID No. 5245	Seq. ID No. 5246	Cyto	
2512c	Seq. ID No. 5247	Seq. ID No. 5248	IM	
2513a	Seq. ID No. 5249	Seq. ID No. 5250	Cyto	
2513b	Seq. ID No. 5251	Seq. ID No. 5252	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2513c	Seq. ID No. 5253	Seq. ID No. 5254	Cyto	
2514	Seq. ID No. 5255	Seq. ID No. 5256	Cyto	
2515	Seq. ID No. 5257	Seq. ID No. 5258	Cyto	
2516a	Seq. ID No. 5259	Seq. ID No. 5260	Cyto	
2516b	Seq. ID No. 5261	Seq. ID No. 5262	Cyto	
2517a	Seq. ID No. 5263	Seq. ID No. 5264	Cyto	
2517b	Seq. ID No. 5265	Seq. ID No. 5266	Cyto	
2519a	Seq. ID No. 5269	Seq. ID No. 5270	Cyto	
2519b	Seq. ID No. 5271	Seq. ID No. 5272	Cyto	0
2523	Seq. ID No. 5283	Seq. ID No. 5284	Cyto	0
2525b	Seq. ID No. 5287	Seq. ID No. 5288	IM	1
2527a	Seq. ID No. 5289	Seq. ID No. 5290	Cyto	
2527b	Seq. ID No. 5291	Seq. ID No. 5292	Cyto	
2528a	Seq. ID No. 5293	Seq. ID No. 5294	Cyto	0
2528b	Seq. ID No. 5295	Seq. ID No. 5296	Cyto	0
2528c	Seq. ID No. 5297	Seq. ID No. 5298	Cyto	0
2528d	Seq. ID No. 5299	Seq. ID No. 5300	Cyto	0
2532b	Seq. ID No. 5301	Seq. ID No. 5302	Cyto	1
2532c	Seq. ID No. 5303	Seq. ID No. 5304	Cyto	1
2534	Seq. ID No. 5305	Seq. ID No. 5306	Cyto	
2535a	Seq. ID No. 5307	Seq. ID No. 5308	Cyto	
2535b	Seq. ID No. 5309	Seq. ID No. 5310	Cyto	
2538	Seq. ID No. 5311	Seq. ID No. 5312	Cyto	
2541	Seq. ID No. 5313	Seq. ID No. 5314	Cyto	
2542a	Seq. ID No. 5315	Seq. ID No. 5316	Cyto	
2542b	Seq. ID No. 5317	Seq. ID No. 5318	Cyto	0
2542c	Seq. ID No. 5319	Seq. ID No. 5320	Cyto	0
2543	Seq. ID No. 5321	Seq. ID No. 5322	Cyto	0
2544	Seq. ID No. 5323	Seq. ID No. 5324	Cyto	0

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2545	Seq. ID No. 5325	Seq. ID No. 5326	Cyto	
2548a	Seq. ID No. 5333	Seq. ID No. 5334	Cyto	0
2548b	Seq. ID No. 5335	Seq. ID No. 5336	Cyto	0
2549	Seq. ID No. 5337	Seq. ID No. 5338	Cyto	0
2550b	Seq. ID No. 5339	Seq. ID No. 5340	Cyto	
2550e	Seq. ID No. 5343	Seq. ID No. 5344	IM	
2552	Seq. ID No. 5345	Seq. ID No. 5346	Cyto	0
2553	Seq. ID No. 5347	Seq. ID No. 5348	Cyto	
2554a	Seq. ID No. 5349	Seq. ID No. 5350	Cyto	
2554b	Seq. ID No. 5351	Seq. ID No. 5352	Cyto	
2555a	Seq. ID No. 5353	Seq. ID No. 5354	Cyto	
2555b	Seq. ID No. 5355	Seq. ID No. 5356	Cyto	0
2555c	Seq. ID No. 5357	Seq. ID No. 5358	Cyto	0
2555d	Seq. ID No. 5359	Seq. ID No. 5360	Cyto	0
2558a	Seq. ID No. 5361	Seq. ID No. 5362	Cyto	
2558b	Seq. ID No. 5363	Seq. ID No. 5364	Cyto	
2559	Seq. ID No. 5365	Seq. ID No. 5366	Cyto	
2561	Seq. ID No. 5367	Seq. ID No. 5368	Cyto	1
2562a	Seq. ID No. 5369	Seq. ID No. 5370	Cyto	
2562c	Seq. ID No. 5371	Seq. ID No. 5372	Cyto	
2563	Seq. ID No. 5373	Seq. ID No. 5374	Cyto	
2564a	Seq. ID No. 5375	Seq. ID No. 5376	Cyto	
2564d	Seq. ID No. 5381	Seq. ID No. 5382	IM	1
2566	Seq. ID No. 5383	Seq. ID No. 5384	IM	
2568	Seq. ID No. 5389	Seq. ID No. 5390	IM	2
2572	Seq. ID No. 5391	Seq. ID No. 5392	IM	0
2573	Seq. ID No. 5393	Seq. ID No. 5394	Cyto	
2575	Seq. ID No. 5395	Seq. ID No. 5396	Cyto	
2576	Seq. ID No. 5397	Seq. ID No. 5398	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2578	Seq. ID No. 5399	Seq. ID No. 5400	Cyto	
2579b	Seq. ID No. 5401	Seq. ID No. 5402	IM	
2581	Seq. ID No. 5403	Seq. ID No. 5404	IM	1
2582b	Seq. ID No. 5407	Seq. ID No. 5408	IM	4
2582c	Seq. ID No. 5409	Seq. ID No. 5410	IM	4
2585	Seq. ID No. 5411	Seq. ID No. 5412	IM	
2588	Seq. ID No. 5417	Seq. ID No. 5418	Cyto	0
2589	Seq. ID No. 5419	Seq. ID No. 5420	Cyto	1
2591	Seq. ID No. 5421	Seq. ID No. 5422	Cyto	0
2592	Seq. ID No. 5423	Seq. ID No. 5424	Cyto	
2593a	Seq. ID No. 5425	Seq. ID No. 5426	Cyto	0
2593b	Seq. ID No. 5427	Seq. ID No. 5428	Cyto	0
2594a	Seq. ID No. 5429	Seq. ID No. 5430	Cyto	
2594b	Seq. ID No. 5431	Seq. ID No. 5432	Cyto	
2597a	Seq. ID No. 5435	Seq. ID No. 5436	Cyto	
2597b	Seq. ID No. 5437	Seq. ID No. 5438	Cyto	
2597c	Seq. ID No. 5439	Seq. ID No. 5440	Cyto	
2598	Seq. ID No. 5441	Seq. ID No. 5442	Cyto	0
2602	Seq. ID No. 5443	Seq. ID No. 5444	Cyto	0
2605a	Seq. ID No. 5445	Seq. ID No. 5446	Cyto	
2605b	Seq. ID No. 5447	Seq. ID No. 5448	Cyto	
2606	Seq. ID No. 5449	Seq. ID No. 5450	Cyto	
2608	Seq. ID No. 5451	Seq. ID No. 5452	Cyto	
2611	Seq. ID No. 5455	Seq. ID No. 5456	Cyto	
2613	Seq. ID No. 5457	Seq. ID No. 5458	Cyto	0
2616e	Seq. ID No. 5467	Seq. ID No. 5468	IM	5
2616f	Seq. ID No. 5469	Seq. ID No. 5470	IM	6
2616g	Seq. ID No. 5471	Seq. ID No. 5472	IM	7
2616h	Seq. ID No. 5473	Seq. ID No. 5474	IM	7

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2617a	Seq. ID No. 5475	Seq. ID No. 5476	IM	
2617b	Seq. ID No. 5477	Seq. ID No. 5478	IM	
2618a	Seq. ID No. 5479	Seq. ID No. 5480	IM	
2618b	Seq. ID No. 5481	Seq. ID No. 5482	IM	
2619	Seq. ID No. 5483	Seq. ID No. 5484	Cyto	
2620	Seq. ID No. 5485	Seq. ID No. 5486	IM	0
2621a	Seq. ID No. 5487	Seq. ID No. 5488	IM	1
2623a	Seq. ID No. 5489	Seq. ID No. 5490	Cyto	
2624a	Seq. ID No. 5493	Seq. ID No. 5494	Cyto	0
2624b	Seq. ID No. 5495	Seq. ID No. 5496	Cyto	0
2625b	Seq. ID No. 5499	Seq. ID No. 5500	IM	3
2626a	Seq. ID No. 5501	Seq. ID No. 5502	Cyto	
2626b	Seq. ID No. 5503	Seq. ID No. 5504	Cyto	
2627a	Seq. ID No. 5505	Seq. ID No. 5506	Cyto	
2627b	Seq. ID No. 5507	Seq. ID No. 5508	Cyto	
2629a	Seq. ID No. 5511	Seq. ID No. 5512	Cyto	
2633a	Seq. ID No. 5519	Seq. ID No. 5520	Cyto	
2633b	Seq. ID No. 5521	Seq. ID No. 5522	Cyto	
2633c	Seq. ID No. 5523	Seq. ID No. 5524	Cyto	
2633e	Seq. ID No. 5527	Seq. ID No. 5528	IM	1
2643a	Seq. ID No. 5535	Seq. ID No. 5536	Cyto	1
2643b	Seq. ID No. 5537	Seq. ID No. 5538	IM	2
2645	Seq. ID No. 5539	Seq. ID No. 5540	Cyto	
2647	Seq. ID No. 5541	Seq. ID No. 5542	Cyto	
2649	Seq. ID No. 5547	Seq. ID No. 5548	IM	1
2650	Seq. ID No. 5549	Seq. ID No. 5550	IM	3
2652a	Seq. ID No. 5551	Seq. ID No. 5552	Cyto	
2652b	Seq. ID No. 5553	Seq. ID No. 5554	Cyto	
2655a	Seq. ID No. 5555	Seq. ID No. 5556	Cyto	



TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2655b	Seq. ID No. 5557	Seq. ID No. 5558	IM	1
2656	Seq. ID No. 5559	Seq. ID No. 5560	Cyto	0
2658a	Seq. ID No. 5561	Seq. ID No. 5562	Cyto	0
2658b	Seq. ID No. 5563	Seq. ID No. 5564	Cyto	0
2659a	Seq. ID No. 5565	Seq. ID No. 5566	IM	3
2659b	Seq. ID No. 5567	Seq. ID No. 5568	IM	4
2662	Seq. ID No. 5571	Seq. ID No. 5572	Cyto	
2664a	Seq. ID No. 5573	Seq. ID No. 5574	Cyto	
2664b	Seq. ID No. 5575	Seq. ID No. 5576	Cyto	
2665	Seq. ID No. 5577	Seq. ID No. 5578	IM	1
2666a	Seq. ID No. 5579	Seq. ID No. 5580	Cyto	0
2666b	Seq. ID No. 5581	Seq. ID No. 5582	Cyto	0
2667a	Seq. ID No. 5583	Seq. ID No. 5584	IM	
2667b	Seq. ID No. 5585	Seq. ID No. 5586	IM	
2674b	Seq. ID No. 5599	Seq. ID No. 5600	IM	11
2676	Seq. ID No. 5601	Seq. ID No. 5602	Cyto	0
2677a	Seq. ID No. 5603	Seq. ID No. 5604	IM	1
2677b	Seq. ID No. 5605	Seq. ID No. 5606	IM	1
2677c	Seq. ID No. 5607	Seq. ID No. 5608	IM	1
2679c	Seq. ID No. 5613	Seq. ID No. 5614	IM	5
2679d	Seq. ID No. 5615	Seq. ID No. 5616	IM	5
2680a	Seq. ID No. 5617	Seq. ID No. 5618	Cyto	
2680b	Seq. ID No. 5619	Seq. ID No. 5620	Cyto	
2684a	Seq. ID No. 5627	Seq. ID No. 5628	IM	0
2684b	Seq. ID No. 5629	Seq. ID No. 5630	IM	0
2686	Seq. ID No. 5631	Seq. ID No. 5632	Cyto	0
2688b	Seq. ID No. 5635	Seq. ID No. 5636	IM	4
2690b	Seq. ID No. 5645	Seq. ID No. 5646	IM	1
2690c	Seq. ID No. 5647	Seq. ID No. 5648	IM	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2693	Seq. ID No. 5651	Seq. ID No. 5652	Cyto	
2694a	Seq. ID No. 5653	Seq. ID No. 5654	Cyto	0
2694b	Seq. ID No. 5655	Seq. ID No. 5656	Cyto	0
2695	Seq. ID No. 5657	Seq. ID No. 5658	Cyto	0
2696b	Seq. ID No. 5661	Seq. ID No. 5662	IM	8
2705	Seq. ID No. 5663	Seq. ID No. 5664	Cyto	
2709	Seq. ID No. 5665	Seq. ID No. 5666	Cyto	
2712	Seq. ID No. 5669	Seq. ID No. 5670	IM	1
2713	Seq. ID No. 5671	Seq. ID No. 5672	Cyto	
2714	Seq. ID No. 5673	Seq. ID No. 5674	Cyto	
2716a	Seq. ID No. 5675	Seq. ID No. 5676	Cyto	
2716b	Seq. ID No. 5677	Seq. ID No. 5678	Cyto	
2716c	Seq. ID No. 5679	Seq. ID No. 5680	Cyto	
2721a	Seq. ID No. 5691	Seq. ID No. 5692	Cyto	
2721b	Seq. ID No. 5693	Seq. ID No. 5694	IM	1
2722a	Seq. ID No. 5695	Seq. ID No. 5696	Cyto	1
2722b	Seq. ID No. 5697	Seq. ID No. 5698	Cyto	1
2724	Seq. ID No. 5701	Seq. ID No. 5702	Cyto	
2726	Seq. ID No. 5707	Seq. ID No. 5708	Cyto	
2731a	Seq. ID No. 5713	Seq. ID No. 5714	Cyto	
2731b	Seq. ID No. 5715	Seq. ID No. 5716	Cyto	
2732	Seq. ID No. 5717	Seq. ID No. 5718	Cyto	
2734b	Seq. ID No. 5721	Seq. ID No. 5722	IM	4
2734c	Seq. ID No. 5723	Seq. ID No. 5724	IM	5
2735a	Seq. ID No. 5725	Seq. ID No. 5726	Cyto	2
2735b	Seq. ID No. 5727	Seq. ID No. 5728	Cyto	2
2738b	Seq. ID No. 5731	Seq. ID No. 5732	IM	11
2742a	Seq. ID No. 5737	Seq. ID No. 5738	Cyto	
2743a	Seq. ID No. 5741	Seq. ID No. 5742	Cyto	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2743b	Seq. ID No. 5743	Seq. ID No. 5744	Cyto	1
2744	Seq. ID No. 5745	Seq. ID No. 5746	IM	
2745a	Seq. ID No. 5747	Seq. ID No. 5748	Cyto	1
2745b	Seq. ID No. 5749	Seq. ID No. 5750	Cyto	1
2746	Seq. ID No. 5751	Seq. ID No. 5752	Cyto	
2747a	Seq. ID No. 5753	Seq. ID No. 5754	Cyto	0
2747b	Seq. ID No. 5755	Seq. ID No. 5756	Cyto	0
2748a	Seq. ID No. 5757	Seq. ID No. 5758	IM	10
2748b	Seq. ID No. 5759	Seq. ID No. 5760	IM	10
2748c	Seq. ID No. 5761	Seq. ID No. 5762	IM	10
2749d	Seq. ID No. 5769	Seq. ID No. 5770	IM	9
2750a	Seq. ID No. 5773	Seq. ID No. 5774	Cyto	
2750b	Seq. ID No. 5775	Seq. ID No. 5776	Cyto	
2752	Seq. ID No. 5777	Seq. ID No. 5778	Cyto	0
2753	Seq. ID No. 5779	Seq. ID No. 5780	Cyto	
2757a	Seq. ID No. 5781	Seq. ID No. 5782	IM	4
2758b	Seq. ID No. 5787	Seq. ID No. 5788	Cyto	0
2758c	Seq. ID No. 5789	Seq. ID No. 5790	Cyto	0
2759a	Seq. ID No. 5793	Seq. ID No. 5794	Cyto	0
2759b	Seq. ID No. 5795	Seq. ID No. 5796	Cyto	0
2760b	Seq. ID No. 5799	Seq. ID No. 5800	IM	1
2760c	Seq. ID No. 5801	Seq. ID No. 5802	IM	1
2762	Seq. ID No. 5803	Seq. ID No. 5804	Cyto	0
2763a	Seq. ID No. 5805	Seq. ID No. 5806	IM	2
2763b	Seq. ID No. 5807	Seq. ID No. 5808	IM	2
2763c	Seq. ID No. 5809	Seq. ID No. 5810	IM	2
2764	Seq. ID No. 5811	Seq. ID No. 5812	IM	
2765b	Seq. ID No. 5813	Seq. ID No. 5814	Cyto	1
2765c	Seq. ID No. 5815	Seq. ID No. 5816	Cyto	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2766a	Seq. ID No. 5817	Seq. ID No. 5818	IM	0
2766b	Seq. ID No. 5819	Seq. ID No. 5820	IM	0
2768a	Seq. ID No. 5821	Seq. ID No. 5822	IM	0
2768b	Seq. ID No. 5823	Seq. ID No. 5824	IM	0
2768c	Seq. ID No. 5825	Seq. ID No. 5826	IM	0
2769a	Seq. ID No. 5827	Seq. ID No. 5828	IM	0
2771a	Seq. ID No. 5831	Seq. ID No. 5832	Cyto	
2771b	Seq. ID No. 5833	Seq. ID No. 5834	Cyto	
2773	Seq. ID No. 5835	Seq. ID No. 5836	IM	1
2774a	Seq. ID No. 5837	Seq. ID No. 5838	IM	2
2774b	Seq. ID No. 5839	Seq. ID No. 5840	IM	2
2774c	Seq. ID No. 5841	Seq. ID No. 5842	IM	2
2776a	Seq. ID No. 5843	Seq. ID No. 5844	Cyto	1
2776b	Seq. ID No. 5845	Seq. ID No. 5846	Cyto	1
2777	Seq. ID No. 5847	Seq. ID No. 5848	Cyto	
2778	Seq. ID No. 5849	Seq. ID No. 5850	Cyto	
2779	Seq. ID No. 5851	Seq. ID No. 5852	IM	1
2780	Seq. ID No. 5853	Seq. ID No. 5854	Cyto	
2784	Seq. ID No. 5855	Seq. ID No. 5856	Cyto	
2785a	Seq. ID No. 5857	Seq. ID No. 5858	Cyto	1
2785b	Seq. ID No. 5859	Seq. ID No. 5860	Cyto	1
2786a	Seq. ID No. 5861	Seq. ID No. 5862	IM	1
2786b	Seq. ID No. 5863	Seq. ID No. 5864	IM	1
2786c	Seq. ID No. 5865	Seq. ID No. 5866	IM	1
2787a	Seq. ID No. 5867	Seq. ID No. 5868	Cyto	1
2787b	Seq. ID No. 5869	Seq. ID No. 5870	Cyto	1
2787c	Seq. ID No. 5871	Seq. ID No. 5872	Cyto	1
2788b	Seq. ID No. 5873	Seq. ID No. 5874	Cyto	1
2789	Seq. ID No. 5875	Seq. ID No. 5876	Cyto	0

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2790	Seq. ID No. 5877	Seq. ID No. 5878	Cyto	
2793	Seq. ID No. 5881	Seq. ID No. 5882	Cyto	
2798	Seq. ID No. 5887	Seq. ID No. 5888	IM	2
2799b	Seq. ID No. 5891	Seq. ID No. 5892	IM	1
2804	Seq. ID No. 5897	Seq. ID No. 5898	IM	0
2809	Seq. ID No. 5903	Seq. ID No. 5904	Cyto	
2810b	Seq. ID No. 5907	Seq. ID No. 5908	IM	3
2810d	Seq. ID No. 5911	Seq. ID No. 5912	IM	4
2812	Seq. ID No. 5913	Seq. ID No. 5914	Cyto	
2814	Seq. ID No. 5915	Seq. ID No. 5916	IM	1
2815	Seq. ID No. 5917	Seq. ID No. 5918	Cyto	
2816	Seq. ID No. 5919	Seq. ID No. 5920	Cyto	
2818c	Seq. ID No. 5925	Seq. ID No. 5926	IM	5
2819	Seq. ID No. 5931	Seq. ID No. 5932	Cyto	
2820	Seq. ID No. 5933	Seq. ID No. 5934	Cyto	
2821a	Seq. ID No. 5935	Seq. ID No. 5936	Cyto	
2821b	Seq. ID No. 5937	Seq. ID No. 5938	Cyto	
2822b	Seq. ID No. 5941	Seq. ID No. 5942	IM	11
2823	Seq. ID No. 5943	Seq. ID No. 5944	Cyto	0
2824a	Seq. ID No. 5945	Seq. ID No. 5946	Cyto	1
2824b	Seq. ID No. 5947	Seq. ID No. 5948	Cyto	1
2829a	Seq. ID No. 5949	Seq. ID No. 5950	Cyto	
2829b	Seq. ID No. 5951	Seq. ID No. 5952	Cyto	
2831b	Seq. ID No. 5953	Seq. ID No. 5954	Cyto	
2832	Seq. ID No. 5955	Seq. ID No. 5956	Cyto	
2833	Seq. ID No. 5957	Seq. ID No. 5958	Cyto	
2834a	Seq. ID No. 5959	Seq. ID No. 5960	Cyto	0
2834b	Seq. ID No. 5961	Seq. ID No. 5962	Cyto	0
2837a	Seq. ID No. 5963	Seq. ID No. 5964	IM	2

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2837b	Seq. ID No. 5965	Seq. ID No. 5966	IM	3
2842a	Seq. ID No. 5967	Seq. ID No. 5968	Cyto	
2842b	Seq. ID No. 5969	Seq. ID No. 5970	Cyto	
2843a	Seq. ID No. 5971	Seq. ID No. 5972	Cyto	
2843b	Seq. ID No. 5973	Seq. ID No. 5974	Cyto	
2845	Seq. ID No. 5975	Seq. ID No. 5976	Cyto	
2846a	Seq. ID No. 5977	Seq. ID No. 5978	Cyto	
2846b	Seq. ID No. 5979	Seq. ID No. 5980	Peri	
2848	Seq. ID No. 5981	Seq. ID No. 5982	Cyto	
2850	Seq. ID No. 5983	Seq. ID No. 5984	Cyto	
2851	Seq. ID No. 5985	Seq. ID No. 5986	Cyto	0
2852	Seq. ID No. 5987	Seq. ID No. 5988	IM	1
2853	Seq. ID No. 5989	Seq. ID No. 5990	Cyto	
2854a	Seq. ID No. 5991	Seq. ID No. 5992	IM	
2854b	Seq. ID No. 5993	Seq. ID No. 5994	IM	
2855	Seq. ID No. 5995	Seq. ID No. 5996	Cyto	
2856a	Seq. ID No. 5997	Seq. ID No. 5998	IM	8
2856b	Seq. ID No. 5999	Seq. ID No. 6000	IM	8
2856c	Seq. ID No. 6001	Seq. ID No. 6002	IM	8
2857	Seq. ID No. 6003	Seq. ID No. 6004	Cyto	
2859	Seq. ID No. 6005	Seq. ID No. 6006	Cyto	
2860a	Seq. ID No. 6007	Seq. ID No. 6008	Cyto	0
2860b	Seq. ID No. 6009	Seq. ID No. 6010	Cyto	0
2860c	Seq. ID No. 6011	Seq. ID No. 6012	Cyto	0
2862	Seq. ID No. 6013	Seq. ID No. 6014	Cyto	2
2863	Seq. ID No. 6015	Seq. ID No. 6016	Cyto	
2864	Seq. ID No. 6017	Seq. ID No. 6018	Cyto	2
2868a	Seq. ID No. 6019	Seq. ID No. 6020	Cyto	
2868b	Seq. ID No. 6021	Seq. ID No. 6022	IM	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2871	Seq. ID No. 6029	Seq. ID No. 6030	Cyto	
2872	Seq. ID No. 6031	Seq. ID No. 6032	Cyto	
2875	Seq. ID No. 6033	Seq. ID No. 6034	Cyto	0
2877	Seq. ID No. 6035	Seq. ID No. 6036	Cyto	
2879a	Seq. ID No. 6037	Seq. ID No. 6038	Cyto	0
2879b	Seq. ID No. 6039	Seq. ID No. 6040	Cyto	0
2879c	Seq. ID No. 6041	Seq. ID No. 6042	Cyto	0
2882	Seq. ID No. 6045	Seq. ID No. 6046	IM	2
2883b	Seq. ID No. 6049	Seq. ID No. 6050	IM	7
2883c	Seq. ID No. 6051	Seq. ID No. 6052	IM	7
2886a	Seq. ID No. 6055	Seq. ID No. 6056	Cyto	0
2886b	Seq. ID No. 6057	Seq. ID No. 6058	Cyto	0
2887b	Seq. ID No. 6061	Seq. ID No. 6062	IM	2
2890	Seq. ID No. 6065	Seq. ID No. 6066	IM	1
2891b	Seq. ID No. 6069	Seq. ID No. 6070	Cyto	1
2891c	Seq. ID No. 6071	Seq. ID No. 6072	Cyto	1
2893b	Seq. ID No. 6073	Seq. ID No. 6074	IM	1
2894a	Seq. ID No. 6075	Seq. ID No. 6076	Cyto	
2894b	Seq. ID No. 6077	Seq. ID No. 6078	Cyto	
2894c	Seq. ID No. 6079	Seq. ID No. 6080	Cyto	
2895	Seq. ID No. 6081	Seq. ID No. 6082	IM	
2897a	Seq. ID No. 6083	Seq. ID No. 6084	Cyto	
2897b	Seq. ID No. 6085	Seq. ID No. 6086	Cyto	
2901b	Seq. ID No. 6093	Seq. ID No. 6094	IM	2
2904	Seq. ID No. 6097	Seq. ID No. 6098	Cyto	
2905a	Seq. ID No. 6099	Seq. ID No. 6100	Cyto	
2905b	Seq. ID No. 6101	Seq. ID No. 6102	Cyto	0
2909a	Seq. ID No. 6105	Seq. ID No. 6106	Cyto	
2912	Seq. ID No. 6113	Seq. ID No. 6114	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2915a	Seq. ID No. 6119	Seq. ID No. 6120	Cyto	
2915b	Seq. ID No. 6121	Seq. ID No. 6122	Cyto	
2915c	Seq. ID No. 6123	Seq. ID No. 6124	Cyto	
2916	Seq. ID No. 6125	Seq. ID No. 6126	Cyto	
2917	Seq. ID No. 6127	Seq. ID No. 6128	OM	1
2918	Seq. ID No. 6129	Seq. ID No. 6130	Cyto	0
2920	Seq. ID No. 6131	Seq. ID No. 6132	IM	2
2921	Seq. ID No. 6133	Seq. ID No. 6134	IM	0
2923b	Seq. ID No. 6139	Seq. ID No. 6140	Cyto	
2923c	Seq. ID No. 6141	Seq. ID No. 6142	Cyto	
2925a	Seq. ID No. 6143	Seq. ID No. 6144	Cyto	
2925b	Seq. ID No. 6145	Seq. ID No. 6146	Cyto	
2926a	Seq. ID No. 6147	Seq. ID No. 6148	Cyto	
2926b	Seq. ID No. 6149	Seq. ID No. 6150	Cyto	
2926c	Seq. ID No. 6151	Seq. ID No. 6152	Cyto	
2928a	Seq. ID No. 6153	Seq. ID No. 6154	Cyto	
2928b	Seq. ID No. 6155	Seq. ID No. 6156	Cyto	
2928c	Seq. ID No. 6157	Seq. ID No. 6158	Cyto	
2933a	Seq. ID No. 6167	Seq. ID No. 6168	Cyto	
2934	Seq. ID No. 6171	Seq. ID No. 6172	Cyto	1
2935a	Seq. ID No. 6173	Seq. ID No. 6174	Cyto	
2935b	Seq. ID No. 6175	Seq. ID No. 6176	Cyto	0
2936	Seq. ID No. 6177	Seq. ID No. 6178	IM	2
2939a	Seq. ID No. 6179	Seq. ID No. 6180	Cyto	
2939b	Seq. ID No. 6181	Seq. ID No. 6182	Cyto	
2943c	Seq. ID No. 6193	Seq. ID No. 6194	IM	6
2943d	Seq. ID No. 6195	Seq. ID No. 6196	IM	6
2945b	Seq. ID No. 6199	Seq. ID No. 6200	IM	0
2947	Seq. ID No. 6201	Seq. ID No. 6202	Cyto	



TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2948c	Seq. ID No. 6207	Seq. ID No. 6208	IM	6
2950a	Seq. ID No. 6211	Seq. ID No. 6212	Cyto	
2950b	Seq. ID No. 6213	Seq. ID No. 6214	Cyto	
2951	Seq. ID No. 6215	Seq. ID No. 6216	Cyto	
2954	Seq. ID No. 6219	Seq. ID No. 6220	IM	7
2955f	Seq. ID No. 6231	Seq. ID No. 6232	IM	12
2955g	Seq. ID No. 6233	Seq. ID No. 6234	IM	12
2958b	Seq. ID No. 6239	Seq. ID No. 6240	IM	2
2962a	Seq. ID No. 6247	Seq. ID No. 6248	Cyto	
2963	Seq. ID No. 6251	Seq. ID No. 6252	Cyto	
2965b	Seq. ID No. 6255	Seq. ID No. 6256	IM	2
2965c	Seq. ID No. 6257	Seq. ID No. 6258	IM	2
2967	Seq. ID No. 6261	Seq. ID No. 6262	Cyto	
2971a	Seq. ID No. 6269	Seq. ID No. 6270	Cyto	0
2971b	Seq. ID No. 6271	Seq. ID No. 6272	Cyto	0
2975	Seq. ID No. 6277	Seq. ID No. 6278	Cyto	1
2977a	Seq. ID No. 6279	Seq. ID No. 6280	IM	4
2977b	Seq. ID No. 6281	Seq. ID No. 6282	IM	4
2979	Seq. ID No. 6287	Seq. ID No. 6288	IM	4
2980b	Seq. ID No. 6291	Seq. ID No. 6292	IM	5
2980c	Seq. ID No. 6293	Seq. ID No. 6294	IM	5
2980d	Seq. ID No. 6295	Seq. ID No. 6296	IM	5
2980e	Seq. ID No. 6297	Seq. ID No. 6298	IM	5
2984	Seq. ID No. 6299	Seq. ID No. 6300	Cyto	0
2986c	Seq. ID No. 6305	Seq. ID No. 6306	IM	7
2988a	Seq. ID No. 6307	Seq. ID No. 6308	Cyto	1
2988b	Seq. ID No. 6309	Seq. ID No. 6310	Cyto	1
2988c	Seq. ID No. 6311	Seq. ID No. 6312	Cyto	1
2989	Seq. ID No. 6313	Seq. ID No. 6314	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
2990	Seq. ID No. 6315	Seq. ID No. 6316	Cyto	0
2991a	Seq. ID No. 6317	Seq. ID No. 6318	IM	
2991b	Seq. ID No. 6319	Seq. ID No. 6320	Cyto	0
2991c	Seq. ID No. 6321	Seq. ID No. 6322	Cyto	0
2992	Seq. ID No. 6323	Seq. ID No. 6324	IM	4
2995a	Seq. ID No. 6329	Seq. ID No. 6330	Cyto	1
2995b	Seq. ID No. 6331	Seq. ID No. 6332	Cyto	1
2997	Seq. ID No. 6333	Seq. ID No. 6334	Cyto	
2998a	Seq. ID No. 6335	Seq. ID No. 6336	Cyto	
2998b	Seq. ID No. 6337	Seq. ID No. 6338	Cyto	
2999	Seq. ID No. 6339	Seq. ID No. 6340	Cyto	
3001	Seq. ID No. 6341	Seq. ID No. 6342	Cyto	
3003	Seq. ID No. 6343	Seq. ID No. 6344	Cyto	
3005	Seq. ID No. 6345	Seq. ID No. 6346	Cyto	
3008a	Seq. ID No. 6347	Seq. ID No. 6348	Cyto	
3008b	Seq. ID No. 6349	Seq. ID No. 6350	Cyto	
3008c	Seq. ID No. 6351	Seq. ID No. 6352	Cyto	
3008d	Seq. ID No. 6353	Seq. ID No. 6354	Cyto	
3010a	Seq. ID No. 6355	Seq. ID No. 6356	Cyto	
3010b	Seq. ID No. 6357	Seq. ID No. 6358	Cyto	
3012	Seq. ID No. 6359	Seq. ID No. 6360	Cyto	
3015	Seq. ID No. 6361	Seq. ID No. 6362	IM	7
3016c	Seq. ID No. 6367	Seq. ID No. 6368	IM	7
3017	Seq. ID No. 6369	Seq. ID No. 6370	Cyto	
3018a	Seq. ID No. 6371	Seq. ID No. 6372	Cyto	
3018b	Seq. ID No. 6373	Seq. ID No. 6374	Cyto	
3020	Seq. ID No. 6375	Seq. ID No. 6376	IM	
3022	Seq. ID No. 6379	Seq. ID No. 6380	Cyto	
3024b	Seq. ID No. 6385	Seq. ID No. 6386	Cyto	1

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
3026a	Seq. ID No. 6387	Seq. ID No. 6388	Cyto	
3026b	Seq. ID No. 6389	Seq. ID No. 6390	Cyto	
3028a	Seq. ID No. 6391	Seq. ID No. 6392	Cyto	
3028b	Seq. ID No. 6393	Seq. ID No. 6394	Cyto	
3028c	Seq. ID No. 6395	Seq. ID No. 6396	Cyto	
3029a	Seq. ID No. 6397	Seq. ID No. 6398	Cyto	
3029b	Seq. ID No. 6399	Seq. ID No. 6400	Cyto	
3031a	Seq. ID No. 6401	Seq. ID No. 6402	Cyto	
3031b	Seq. ID No. 6403	Seq. ID No. 6404	Cyto	
3032a	Seq. ID No. 6405	Seq. ID No. 6406	Cyto	
3032b	Seq. ID No. 6407	Seq. ID No. 6408	Cyto	
3033a	Seq. ID No. 6409	Seq. ID No. 6410	Cyto	
3033b	Seq. ID No. 6411	Seq. ID No. 6412	Cyto	
3035	Seq. ID No. 6413	Seq. ID No. 6414	Cyto	1
3037b	Seq. ID No. 6417	Seq. ID No. 6418	IM	1
3038	Seq. ID No. 6419	Seq. ID No. 6420	Cyto	
3040a	Seq. ID No. 6421	Seq. ID No. 6422	Cyto	
3040b	Seq. ID No. 6423	Seq. ID No. 6424	Cyto	
3044	Seq. ID No. 6433	Seq. ID No. 6434	IM	1
3045a	Seq. ID No. 6435	Seq. ID No. 6436	Cyto	
3045b	Seq. ID No. 6437	Seq. ID No. 6438	Cyto	
3048a	Seq. ID No. 6439	Seq. ID No. 6440	Cyto	
3049a	Seq. ID No. 6441	Seq. ID No. 6442	Cyto	
3049b	Seq. ID No. 6443	Seq. ID No. 6444	Cyto	
3049c	Seq. ID No. 6445	Seq. ID No. 6446	Cyto	
3051a	Seq. ID No. 6447	Seq. ID No. 6448	Cyto	
3051b	Seq. ID No. 6449	Seq. ID No. 6450	Cyto	
3052	Seq. ID No. 6451	Seq. ID No. 6452	Cyto	
3054	Seq. ID No. 6453	Seq. ID No. 6454	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
3055a	Seq. ID No. 6455	Seq. ID No. 6456	Cyto	
3055b	Seq. ID No. 6457	Seq. ID No. 6458	Cyto	
3057	Seq. ID No. 6459	Seq. ID No. 6460	Cyto	
3059	Seq. ID No. 6461	Seq. ID No. 6462	Cyto	
3060	Seq. ID No. 6463	Seq. ID No. 6464	IM	5
3061	Seq. ID No. 6465	Seq. ID No. 6466	Peri	1
3062	Seq. ID No. 6467	Seq. ID No. 6468	IM	5
3063a	Seq. ID No. 6469	Seq. ID No. 6470	Cyto	0
3063b	Seq. ID No. 6471	Seq. ID No. 6472	Cyto	0
3065a	Seq. ID No. 6475	Seq. ID No. 6476	Cyto	
3065b	Seq. ID No. 6477	Seq. ID No. 6478	Cyto	
3067	Seq. ID No. 6481	Seq. ID No. 6482	Cyto	
3068	Seq. ID No. 6483	Seq. ID No. 6484	Cyto	
3069	Seq. ID No. 6485	Seq. ID No. 6486	Cyto	
3071	Seq. ID No. 6487	Seq. ID No. 6488	Cyto	
3072a	Seq. ID No. 6489	Seq. ID No. 6490	Cyto	
3073	Seq. ID No. 6491	Seq. ID No. 6492	Cyto	
3074	Seq. ID No. 6493	Seq. ID No. 6494	Cyto	
3075	Seq. ID No. 6495	Seq. ID No. 6496	Cyto	
3077a	Seq. ID No. 6499	Seq. ID No. 6500	Cyto	
3077b	Seq. ID No. 6501	Seq. ID No. 6502	Cyto	
3077c	Seq. ID No. 6503	Seq. ID No. 6504	Cyto	
3078	Seq. ID No. 6505	Seq. ID No. 6506	Cyto	1
3079	Seq. ID No. 6507	Seq. ID No. 6508	IM	1
3081a	Seq. ID No. 6509	Seq. ID No. 6510	Cyto	
3081b	Seq. ID No. 6511	Seq. ID No. 6512	Cyto	
3083c	Seq. ID No. 6513	Seq. ID No. 6514	Cyto	
3083d	Seq. ID No. 6515	Seq. ID No. 6516	Cyto	
3086	Seq. ID No. 6519	Seq. ID No. 6520	Cyto	

TABLE 6: SIGNALP: NON-SECRETORY

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	PSORT	MSD
3087a	Seq. ID No. 6521	Seq. ID No. 6522	Cyto	
3087c	Seq. ID No. 6523	Seq. ID No. 6524	Cyto	
3088	Seq. ID No. 6525	Seq. ID No. 6526	Cyto	
3089a	Seq. ID No. 6527	Seq. ID No. 6528	Cyto	
3089b	Seq. ID No. 6529	Seq. ID No. 6530	Cyto	
3090	Seq. ID No. 6531	Seq. ID No. 6532	Cyto	
3091	Seq. ID No. 6533	Seq. ID No. 6534	Cyto	
3092a	Seq. ID No. 6535	Seq. ID No. 6536	Cyto	
3092b	Seq. ID No. 6537	Seq. ID No. 6538	Cyto	
3095	Seq. ID No. 6539	Seq. ID No. 6540	IM	1
3097	Seq. ID No. 6545	Seq. ID No. 6546	Cyto	
3098a	Seq. ID No. 6547	Seq. ID No. 6548	Cyto	0
3098b	Seq. ID No. 6549	Seq. ID No. 6550	Cyto	0
3098c	Seq. ID No. 6551	Seq. ID No. 6552	Cyto	0
3099	Seq. ID No. 6553	Seq. ID No. 6554	Cyto	
3101	Seq. ID No. 6559	Seq. ID No. 6560	Cyto	
3102	Seq. ID No. 6561	Seq. ID No. 6562	Peri	2
3103b	Seq. ID No. 6563	Seq. ID No. 6564	Cyto	
3104	Seq. ID No. 6565	Seq. ID No. 6566	Cyto	
3105	Seq. ID No. 6567	Seq. ID No. 6568	Cyto	
3106	Seq. ID No. 6569	Seq. ID No. 6570	Cyto	
3108a	Seq. ID No. 6575	Seq. ID No. 6576	Cyto	
3108b	Seq. ID No. 6577	Seq. ID No. 6578	Peri	
3109	Seq. ID No. 6579	Seq. ID No. 6580	Cyto	
3110b	Seq. ID No. 6583	Seq. ID No. 6584	IM	2
3113	Seq. ID No. 6585	Seq. ID No. 6586	IM	1
3116	Seq. ID No. 6587	Seq. ID No. 6588	Cyto	1
3118a	Seq. ID No. 6589	Seq. ID No. 6590	Cyto	
3118b	Seq. ID No. 6591	Seq. ID No. 6592	Cyto	

**TABLE 6: SIGNALP: NON-SECRETORY**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>PSORT</b>	<b>MSD</b>
3121	Seq. ID No. 6605	Seq. ID No. 6606	Cyto	
3122a	Seq. ID No. 6607	Seq. ID No. 6608	Cyto	2
3122b	Seq. ID No. 6609	Seq. ID No. 6610	Cyto	2
3123a	Seq. ID No. 6611	Seq. ID No. 6612	IM	0
3123b	Seq. ID No. 6613	Seq. ID No. 6614	IM	0
3124	Seq. ID No. 6615	Seq. ID No. 6616	IM	1
3126	Seq. ID No. 6617	Seq. ID No. 6618	Cyto	0
3129a	Seq. ID No. 6619	Seq. ID No. 6620	Cyto	2
3129b	Seq. ID No. 6621	Seq. ID No. 6622	Cyto	2
3131	Seq. ID No. 6623	Seq. ID No. 6624	IM	2
3134a	Seq. ID No. 6625	Seq. ID No. 6626	Cyto	0
3134b	Seq. ID No. 6627	Seq. ID No. 6628	IM	0
3138	Seq. ID No. 6629	Seq. ID No. 6630	IM	0
3141	Seq. ID No. 6633	Seq. ID No. 6634	Cyto	2
3145a	Seq. ID No. 6635	Seq. ID No. 6636	Cyto	0
3147a	Seq. ID No. 6641	Seq. ID No. 6642	Cyto	
3149a	Seq. ID No. 6647	Seq. ID No. 6648	Cyto	

Listed in Table 7 are 287 ORFs whose Pfam results predict possible secreted, surface or membrane localization of proteins encoded by the ORFs.

**TABLE 7: PFAM**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>Pfam</b>
51c	Seq. ID No. 89	Seq. ID No. 90	Sodium:dicarboxylate symporter family
80c	Seq. ID No. 145	Seq. ID No. 146	Formate/nitrite transporter
85b	Seq. ID No. 155	Seq. ID No. 156	ABC transporter
88	Seq. ID No. 167	Seq. ID No. 168	Binding-protein-dependent transport s
91b	Seq. ID No. 173	Seq. ID No. 174	NLPA lipoprotein
99	Seq. ID No. 191	Seq. ID No. 192	Phosphotransferase system, EIIC

TABLE 7: PFAM

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Pfam
109d	Seq. ID No. 215	Seq. ID No. 216	ABC 3 transport family
111b	Seq. ID No. 219	Seq. ID No. 220	ABC 3 transport family
112a	Seq. ID No. 221	Seq. ID No. 222	ABC transporter
112b	Seq. ID No. 223	Seq. ID No. 224	ABC transporter
114	Seq. ID No. 225	Seq. ID No. 226	Periplasmic solute binding protein fa
121	Seq. ID No. 233	Seq. ID No. 234	ABC transporter
124c	Seq. ID No. 239	Seq. ID No. 240	Binding-protein-dependent transport s
129b	Seq. ID No. 251	Seq. ID No. 252	Phosphotransferase system, EIIC
129c	Seq. ID No. 253	Seq. ID No. 254	PTS system, Fructose specific IIB sub
138a	Seq. ID No. 271	Seq. ID No. 272	E1-E2 ATPase
145d	Seq. ID No. 291	Seq. ID No. 292	AbgT putative transporter family
162c	Seq. ID No. 331	Seq. ID No. 332	Cobalt transport protein
165a	Seq. ID No. 341	Seq. ID No. 342	ABC transporter
167	Seq. ID No. 345	Seq. ID No. 346	ABC transporter
180b	Seq. ID No. 375	Seq. ID No. 376	eubacterial secY protein
245c	Seq. ID No. 501	Seq. ID No. 502	Permease family
246b	Seq. ID No. 505	Seq. ID No. 506	Cell cycle protein
248b	Seq. ID No. 511	Seq. ID No. 512	Cell cycle protein
255c	Seq. ID No. 529	Seq. ID No. 530	Sodium:solute symporter family
273a	Seq. ID No. 567	Seq. ID No. 568	phosphotransferase system, EIIB
273b	Seq. ID No. 569	Seq. ID No. 570	Phosphotransferase system, EIIC
277c	Seq. ID No. 575	Seq. ID No. 576	ApbE family
283b	Seq. ID No. 593	Seq. ID No. 594	Bacterial extracellular solute-bindin
284a	Seq. ID No. 595	Seq. ID No. 596	Binding-protein-dependent transport s
286a	Seq. ID No. 601	Seq. ID No. 602	ABC transporter
311	Seq. ID No. 637	Seq. ID No. 638	ABC transporter
315	Seq. ID No. 649	Seq. ID No. 650	ABC transporter
318c	Seq. ID No. 661	Seq. ID No. 662	NLPA lipoprotein
321	Seq. ID No. 669	Seq. ID No. 670	NLPA lipoprotein

TABLE 7: PFAM

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Pfam
324	Seq. ID No. 675	Seq. ID No. 676	NLPA lipoprotein
327c	Seq. ID No. 681	Seq. ID No. 682	Binding-protein-dependent transport s
329	Seq. ID No. 683	Seq. ID No. 684	ABC transporter
342h	Seq. ID No. 729	Seq. ID No. 730	Uncharacterized membrane protein fami
351	Seq. ID No. 753	Seq. ID No. 754	ABC transporter
358b	Seq. ID No. 779	Seq. ID No. 780	Na <sup>+</sup> /H <sup>+</sup> antiporter family
384b	Seq. ID No. 827	Seq. ID No. 828	Phosphotransferase system, EIIC
391	Seq. ID No. 839	Seq. ID No. 840	Glycosyl transferase family 8
418b	Seq. ID No. 895	Seq. ID No. 896	E1-E2 ATPase
435	Seq. ID No. 939	Seq. ID No. 940	Metallo-beta-lactamase superfamily
450a	Seq. ID No. 969	Seq. ID No. 970	ABC transporter
452e	Seq. ID No. 985	Seq. ID No. 986	Predicted permease
464c	Seq. ID No. 1015	Seq. ID No. 1016	Cation transport protein
472f	Seq. ID No. 1039	Seq. ID No. 1040	Cation transport protein
492	Seq. ID No. 1075	Seq. ID No. 1076	NLPA lipoprotein
524b	Seq. ID No. 1137	Seq. ID No. 1138	60Kd inner membrane protein
533	Seq. ID No. 1155	Seq. ID No. 1156	Phosphotransferase system, EIIC
539c	Seq. ID No. 1163	Seq. ID No. 1164	ABC transporter
543a	Seq. ID No. 1175	Seq. ID No. 1176	ABC transporter
561	Seq. ID No. 1223	Seq. ID No. 1224	ABC transporter
564c	Seq. ID No. 1231	Seq. ID No. 1232	BioY family
570b	Seq. ID No. 1237	Seq. ID No. 1238	ABC transporter
573	Seq. ID No. 1241	Seq. ID No. 1242	ABC transporter
586a	Seq. ID No. 1261	Seq. ID No. 1262	Large-conductance mechanosensitive ch
613d	Seq. ID No. 1331	Seq. ID No. 1332	Sodium/hydrogen exchanger family
618	Seq. ID No. 1339	Seq. ID No. 1340	Mechanosensitive ion channel
631d	Seq. ID No. 1369	Seq. ID No. 1370	5'-nucleotidase, C-terminal domain
698	Seq. ID No. 1477	Seq. ID No. 1478	LrgA family
722c	Seq. ID No. 1517	Seq. ID No. 1518	PTS system Galactitol-specific IIC co



TABLE 7: PFAM

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Pfam
728b	Seq. ID No. 1531	Seq. ID No. 1532	PTS system sorbose-specific iic compo
730d	Seq. ID No. 1539	Seq. ID No. 1540	PTS system mannose/fructose/sorbose f
738c	Seq. ID No. 1549	Seq. ID No. 1550	PTS system Galactitol-specific IIC co
744	Seq. ID No. 1563	Seq. ID No. 1564	Bacterial extracellular solute-bindin
745b	Seq. ID No. 1567	Seq. ID No. 1568	Binding-protein-dependent transport s
746b	Seq. ID No. 1571	Seq. ID No. 1572	Binding-protein-dependent transport s
747	Seq. ID No. 1573	Seq. ID No. 1574	ABC transporter
754d	Seq. ID No. 1589	Seq. ID No. 1590	PTS system, Lactose/Cellobiose specif
758	Seq. ID No. 1595	Seq. ID No. 1596	PTS system, Lactose/Cellobiose specif
788b	Seq. ID No. 1647	Seq. ID No. 1648	Binding-protein-dependent transport s
792	Seq. ID No. 1657	Seq. ID No. 1658	ABC transporter
859d	Seq. ID No. 1771	Seq. ID No. 1772	E1-E2 ATPase
866b	Seq. ID No. 1785	Seq. ID No. 1786	ABC transporter
868b	Seq. ID No. 1789	Seq. ID No. 1790	Binding-protein-dependent transport s
885	Seq. ID No. 1819	Seq. ID No. 1820	Histidine kinase-, DNA gyrase B-, and
886	Seq. ID No. 1821	Seq. ID No. 1822	D-alanyl-D-alanine carboxypeptidase
977a	Seq. ID No. 1969	Seq. ID No. 1970	NLPA lipoprotein
998b	Seq. ID No. 2015	Seq. ID No. 2016	PAP2 superfamily
1016c	Seq. ID No. 2047	Seq. ID No. 2048	ABC transporter
1036a	Seq. ID No. 2087	Seq. ID No. 2088	Binding-protein-dependent transport s
1036b	Seq. ID No. 2089	Seq. ID No. 2090	Bacterial extracellular solute-bindin
1037	Seq. ID No. 2093	Seq. ID No. 2094	ABC transporter
1047b	Seq. ID No. 2115	Seq. ID No. 2116	Periplasmic solute binding protein fa
1049a	Seq. ID No. 2117	Seq. ID No. 2118	ABC transporter
1050d	Seq. ID No. 2127	Seq. ID No. 2128	ABC 3 transport family
1060b	Seq. ID No. 2141	Seq. ID No. 2142	Bacterial transferase hexapeptide (fo
1077e	Seq. ID No. 2179	Seq. ID No. 2180	Polysaccharide biosynthesis protein
1094b	Seq. ID No. 2207	Seq. ID No. 2208	Peptidase family M41
1100	Seq. ID No. 2223	Seq. ID No. 2224	ABC transporter

TABLE 7: PFAM

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Pfam
1127	Seq. ID No. 2253	Seq. ID No. 2254	ABC transporter
1140c	Seq. ID No. 2275	Seq. ID No. 2276	E1-E2 ATPase
1149	Seq. ID No. 2301	Seq. ID No. 2302	ABC transporter
1152g	Seq. ID No. 2315	Seq. ID No. 2316	Binding-protein-dependent transport s
1155g	Seq. ID No. 2329	Seq. ID No. 2330	Binding-protein-dependent transport s
1165	Seq. ID No. 2343	Seq. ID No. 2344	NLP/P60 family
1167b	Seq. ID No. 2349	Seq. ID No. 2350	His Kinase A (phosphoacceptor) domain
1171c	Seq. ID No. 2363	Seq. ID No. 2364	ABC transporter
1179c	Seq. ID No. 2381	Seq. ID No. 2382	Metallo-beta-lactamase superfamily
1180e	Seq. ID No. 2391	Seq. ID No. 2392	Phospholipase D. Active site motif
1191	Seq. ID No. 2417	Seq. ID No. 2418	ABC transporter
1192b	Seq. ID No. 2421	Seq. ID No. 2422	Peptidase family M48
1194	Seq. ID No. 2423	Seq. ID No. 2424	LemA family
1197	Seq. ID No. 2429	Seq. ID No. 2430	Peptidase family U7
1221a	Seq. ID No. 2481	Seq. ID No. 2482	ABC transporter
1224a	Seq. ID No. 2487	Seq. ID No. 2488	CAAX amino terminal protease family
1224b	Seq. ID No. 2489	Seq. ID No. 2490	CAAX amino terminal protease family
1224c	Seq. ID No. 2491	Seq. ID No. 2492	CAAX amino terminal protease family
1233a	Seq. ID No. 2509	Seq. ID No. 2510	ABC transporter
1234c	Seq. ID No. 2519	Seq. ID No. 2520	Uncharacterised protein family (UPF00
1237	Seq. ID No. 2525	Seq. ID No. 2526	LysM domain
1245d	Seq. ID No. 2547	Seq. ID No. 2548	AbgT putative transporter family
1246b	Seq. ID No. 2553	Seq. ID No. 2554	Metallo-beta-lactamase superfamily
1250e	Seq. ID No. 2563	Seq. ID No. 2564	Sodium:dicarboxylate symporter family
1258c	Seq. ID No. 2587	Seq. ID No. 2588	E1-E2 ATPase
1266b	Seq. ID No. 2599	Seq. ID No. 2600	AziC protein
1268b	Seq. ID No. 2607	Seq. ID No. 2608	ABC transporter
1271	Seq. ID No. 2613	Seq. ID No. 2614	ABC transporter
1288	Seq. ID No. 2651	Seq. ID No. 2652	Cell envelope-related transcriptional

TABLE 7: PFAM

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Pfam
1305b	Seq. ID No. 2675	Seq. ID No. 2676	ABC transporter
1308b	Seq. ID No. 2681	Seq. ID No. 2682	Predicted permease
1308e	Seq. ID No. 2687	Seq. ID No. 2688	Predicted permease
1315	Seq. ID No. 2693	Seq. ID No. 2694	Histidine kinase-, DNA gyrase B-, and
1318	Seq. ID No. 2699	Seq. ID No. 2700	Phosphate-binding protein
1319b	Seq. ID No. 2703	Seq. ID No. 2704	Binding-protein-dependent transport s
1320c	Seq. ID No. 2709	Seq. ID No. 2710	Binding-protein-dependent transport s
1321	Seq. ID No. 2711	Seq. ID No. 2712	ABC transporter
1333	Seq. ID No. 2727	Seq. ID No. 2728	ABC transporter
1348	Seq. ID No. 2753	Seq. ID No. 2754	Prolipoprotein diacylglycerol transfe
1384a	Seq. ID No. 2819	Seq. ID No. 2820	Preprotein translocase SecG subunit
1384b	Seq. ID No. 2821	Seq. ID No. 2822	Preprotein translocase SecG subunit
1384c	Seq. ID No. 2823	Seq. ID No. 2824	Preprotein translocase SecG subunit
1408	Seq. ID No. 2867	Seq. ID No. 2868	ABC transporter
1410	Seq. ID No. 2871	Seq. ID No. 2872	ABC transporter
1426b	Seq. ID No. 2907	Seq. ID No. 2908	Ribonuclease BN-like family
1431	Seq. ID No. 2919	Seq. ID No. 2920	ABC transporter
1442b	Seq. ID No. 2957	Seq. ID No. 2958	ABC transporter
1447b	Seq. ID No. 2971	Seq. ID No. 2972	Sodium/glutamate symporter
1451	Seq. ID No. 2979	Seq. ID No. 2980	ABC transporter
1457c	Seq. ID No. 2999	Seq. ID No. 3000	Na <sup>+</sup> /Pi-cotransporter
1462b	Seq. ID No. 3005	Seq. ID No. 3006	ABC transporter
1466d	Seq. ID No. 3019	Seq. ID No. 3020	ABC transporter
1471	Seq. ID No. 3035	Seq. ID No. 3036	Ion transport protein
1484b	Seq. ID No. 3065	Seq. ID No. 3066	Divalent cation transporter
1488g	Seq. ID No. 3085	Seq. ID No. 3086	Divalent cation transporter
1517c	Seq. ID No. 3149	Seq. ID No. 3150	Mechanosensitive ion channel
1530b	Seq. ID No. 3165	Seq. ID No. 3166	Transglycosylase
1543	Seq. ID No. 3183	Seq. ID No. 3184	NLP/P60 family

TABLE 7: PFAM

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Pfam
1554c	Seq. ID No. 3203	Seq. ID No. 3204	Bacterial type II secretion system pr ...
1556c	Seq. ID No. 3211	Seq. ID No. 3212	ABC transporter
1573	Seq. ID No. 3251	Seq. ID No. 3252	ABC transporter
1578	Seq. ID No. 3259	Seq. ID No. 3260	ABC transporter
1606b	Seq. ID No. 3319	Seq. ID No. 3320	Histidine kinase-, DNA gyrase B-, and
1607b	Seq. ID No. 3323	Seq. ID No. 3324	60Kd inner membrane protein
1616b	Seq. ID No. 3335	Seq. ID No. 3336	FtsK/SpoIIIE family
1619	Seq. ID No. 3337	Seq. ID No. 3338	Basic membrane protein
1623c	Seq. ID No. 3347	Seq. ID No. 3348	ABC transporter
1626b	Seq. ID No. 3359	Seq. ID No. 3360	Branched-chain amino acid transport s
1634c	Seq. ID No. 3377	Seq. ID No. 3378	Mannosyl-glycoprotein endo-beta-N-ace
1639b	Seq. ID No. 3379	Seq. ID No. 3380	LysM domain
1646f	Seq. ID No. 3399	Seq. ID No. 3400	Polysaccharide biosynthesis protein
1659c	Seq. ID No. 3425	Seq. ID No. 3426	Na <sup>+</sup> /H <sup>+</sup> antiporter family
1683b	Seq. ID No. 3483	Seq. ID No. 3484	Ribonuclease BN-like family
1688c	Seq. ID No. 3495	Seq. ID No. 3496	Glycosyl transferase
1689a	Seq. ID No. 3497	Seq. ID No. 3498	Glycosyl transferase
1694d	Seq. ID No. 3519	Seq. ID No. 3520	Cell envelope-related transcriptional
1699b	Seq. ID No. 3529	Seq. ID No. 3530	Polysaccharide biosynthesis protein
1737b	Seq. ID No. 3599	Seq. ID No. 3600	GA module
1743	Seq. ID No. 3611	Seq. ID No. 3612	GA module
1744b	Seq. ID No. 3615	Seq. ID No. 3616	GA module
1747	Seq. ID No. 3619	Seq. ID No. 3620	GA module
1769b	Seq. ID No. 3663	Seq. ID No. 3664	Type IV leader peptidase family
1804b	Seq. ID No. 3739	Seq. ID No. 3740	Na <sup>+</sup> /H <sup>+</sup> antiporter subunit
1808d	Seq. ID No. 3759	Seq. ID No. 3760	NADH-Ubiquinone/plastoquinone (comple
1809f	Seq. ID No. 3771	Seq. ID No. 3772	NADH-Ubiquinone/plastoquinone (comple
1816c	Seq. ID No. 3797	Seq. ID No. 3798	Transglycosylase
1833	Seq. ID No. 3825	Seq. ID No. 3826	5'-nucleotidase, C-terminal domain

TABLE 7: PFAM

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Pfam
1838c	Seq. ID No. 3841	Seq. ID No. 3842	ABC transporter
1842d	Seq. ID No. 3855	Seq. ID No. 3856	Phosphotransferase system, EIIC
1845c	Seq. ID No. 3863	Seq. ID No. 3864	Voltage gated chloride channel
1861b	Seq. ID No. 3901	Seq. ID No. 3902	ABC transporter
1875c	Seq. ID No. 3929	Seq. ID No. 3930	Signal peptidase I
1925	Seq. ID No. 4015	Seq. ID No. 4016	Anion-transporting ATPase
1926	Seq. ID No. 4017	Seq. ID No. 4018	ABC transporter
1939c	Seq. ID No. 4055	Seq. ID No. 4056	ABC transporter
1946c	Seq. ID No. 4075	Seq. ID No. 4076	Sodium:alanine symporter family
1951c	Seq. ID No. 4085	Seq. ID No. 4086	ABC transporter
1953	Seq. ID No. 4089	Seq. ID No. 4090	Patatin-like phospholipase
1957	Seq. ID No. 4099	Seq. ID No. 4100	ABC transporter
1958c	Seq. ID No. 4105	Seq. ID No. 4106	Branched-chain amino acid transport s
1969	Seq. ID No. 4129	Seq. ID No. 4130	Signal peptidase (SPase) II
2008	Seq. ID No. 4203	Seq. ID No. 4204	Prokaryotic diacylglycerol kinase
2023b	Seq. ID No. 4243	Seq. ID No. 4244	Rhomboid family
2024d	Seq. ID No. 4251	Seq. ID No. 4252	Penicillin binding protein transpepti
2074b	Seq. ID No. 4343	Seq. ID No. 4344	N-acetylmuramoyl-L-alanine amidase
2094	Seq. ID No. 4383	Seq. ID No. 4384	ABC transporter
2142b	Seq. ID No. 4475	Seq. ID No. 4476	Phosphatidate cytidyltransferase
2146	Seq. ID No. 4481	Seq. ID No. 4482	NLPA lipoprotein
2147c	Seq. ID No. 4487	Seq. ID No. 4488	Binding-protein-dependent transport s
2149b	Seq. ID No. 4491	Seq. ID No. 4492	ABC transporter
2165	Seq. ID No. 4533	Seq. ID No. 4534	Uncharacterised protein family (UPF01
2212b	Seq. ID No. 4627	Seq. ID No. 4628	LysM domain
2249	Seq. ID No. 4705	Seq. ID No. 4706	Bacterial extracellular solute-bindin
2253d	Seq. ID No. 4713	Seq. ID No. 4714	Binding-protein-dependent transport s
2255b	Seq. ID No. 4717	Seq. ID No. 4718	Binding-protein-dependent transport s
2256	Seq. ID No. 4719	Seq. ID No. 4720	ABC transporter

TABLE 7: PFAM

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Pfam
2260c	Seq. ID No. 4729	Seq. ID No. 4730	ABC transporter
2288	Seq. ID No. 4789	Seq. ID No. 4790	Patatin-like phospholipase
2290	Seq. ID No. 4791	Seq. ID No. 4792	ATP synthase subunit D
2291a	Seq. ID No. 4793	Seq. ID No. 4794	ATP synthase alpha/beta family, nucle
2292c	Seq. ID No. 4803	Seq. ID No. 4804	ATP synthase alpha/beta family, nucle
2300	Seq. ID No. 4813	Seq. ID No. 4814	ATP synthase subunit C
2301	Seq. ID No. 4815	Seq. ID No. 4816	V-type ATPase 116kDa subunit family
2307	Seq. ID No. 4825	Seq. ID No. 4826	Binding-protein-dependent transport s
2309c	Seq. ID No. 4833	Seq. ID No. 4834	Binding-protein-dependent transport s
2311	Seq. ID No. 4837	Seq. ID No. 4838	ABC transporter
2329d	Seq. ID No. 4875	Seq. ID No. 4876	Competence protein
2331	Seq. ID No. 4879	Seq. ID No. 4880	Helix-hairpin-helix motif
2357	Seq. ID No. 4919	Seq. ID No. 4920	Histidine kinase-, DNA gyrase B-, and
2363b	Seq. ID No. 4931	Seq. ID No. 4932	Uncharacterized BCR, YceG family COG1
2370	Seq. ID No. 4947	Seq. ID No. 4948	Bacterial transferase hexapeptide (fo
2387	Seq. ID No. 4985	Seq. ID No. 4986	Uncharacterized BCR, YitT family COG1
2428c	Seq. ID No. 5077	Seq. ID No. 5078	Pyridoxal-phosphate dependent enzyme
2453	Seq. ID No. 5115	Seq. ID No. 5116	Periplasmic binding protein
2455	Seq. ID No. 5117	Seq. ID No. 5118	ABC transporter
2456e	Seq. ID No. 5127	Seq. ID No. 5128	FecCD transport family
2458g	Seq. ID No. 5141	Seq. ID No. 5142	FecCD transport family
2482	Seq. ID No. 5193	Seq. ID No. 5194	YGGT family
2495b	Seq. ID No. 5215	Seq. ID No. 5216	Glycosyl transferase
2497b	Seq. ID No. 5219	Seq. ID No. 5220	Penicillin binding protein transpepti
2520b	Seq. ID No. 5275	Seq. ID No. 5276	PEP-utilizing enzyme, TIM barrel doma
2564d	Seq. ID No. 5381	Seq. ID No. 5382	D-alanyl-D-alanine carboxypeptidase
2568	Seq. ID No. 5389	Seq. ID No. 5390	ABC transporter
2582c	Seq. ID No. 5409	Seq. ID No. 5410	Cobalt transport protein
2585	Seq. ID No. 5411	Seq. ID No. 5412	ABC transporter

TABLE 7: PFAM

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Pfam
2617a	Seq. ID No. 5475	Seq. ID No. 5476	ABC transporter
2623b	Seq. ID No. 5491	Seq. ID No. 5492	PPIC-type PPIASE domain
2629b	Seq. ID No. 5513	Seq. ID No. 5514	Bacterial extracellular solute-bindin
2633a	Seq. ID No. 5519	Seq. ID No. 5520	Bacterial extracellular solute-bindin
2633d	Seq. ID No. 5525	Seq. ID No. 5526	Bacterial extracellular solute-bindin
2637a	Seq. ID No. 5529	Seq. ID No. 5530	Bacterial extracellular solute-bindin
2643b	Seq. ID No. 5537	Seq. ID No. 5538	Transglycosylase
2655b	Seq. ID No. 5557	Seq. ID No. 5558	Uncharacterized secreted proteins, Ya
2666b	Seq. ID No. 5581	Seq. ID No. 5582	MutS family, N-terminal putative DNA
2674b	Seq. ID No. 5599	Seq. ID No. 5600	Carbon starvation protein CstA
2688c	Seq. ID No. 5637	Seq. ID No. 5638	CDP-alcohol phosphatidyltransferase
2718c	Seq. ID No. 5685	Seq. ID No. 5686	Uncharacterized BCR, COG1963
2734c	Seq. ID No. 5723	Seq. ID No. 5724	Cation efflux family
2747b	Seq. ID No. 5755	Seq. ID No. 5756	Metallo-beta-lactamase superfamily
2748c	Seq. ID No. 5761	Seq. ID No. 5762	Uncharacterized membrane protein fami
2801b	Seq. ID No. 5895	Seq. ID No. 5896	HAMP domain
2805b	Seq. ID No. 5901	Seq. ID No. 5902	Predicted permease
2809	Seq. ID No. 5903	Seq. ID No. 5904	ABC transporter
2810d	Seq. ID No. 5911	Seq. ID No. 5912	Predicted permease
2812	Seq. ID No. 5913	Seq. ID No. 5914	ABC transporter
2816	Seq. ID No. 5919	Seq. ID No. 5920	ABC transporter
2818b	Seq. ID No. 5923	Seq. ID No. 5924	Binding-protein-dependent transport s
2818e	Seq. ID No. 5929	Seq. ID No. 5930	Bacterial extracellular solute-bindin
2856c	Seq. ID No. 6001	Seq. ID No. 6002	E1-E2 ATPase
2881	Seq. ID No. 6043	Seq. ID No. 6044	Mannosyl-glycoprotein endo-beta-N-ace
2883d	Seq. ID No. 6053	Seq. ID No. 6054	Predicted permease
2886a	Seq. ID No. 6055	Seq. ID No. 6056	ABC transporter
2900b	Seq. ID No. 6089	Seq. ID No. 6090	LysM domain
2902	Seq. ID No. 6095	Seq. ID No. 6096	LysM domain

TABLE 7: PFAM

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Pfam
2909d	Seq. ID No. 6111	Seq. ID No. 6112	Sulfatase
2913b	Seq. ID No. 6117	Seq. ID No. 6118	Histidine kinase-, DNA gyrase B-, and
2931c	Seq. ID No. 6165	Seq. ID No. 6166	Sodium:solute symporter family
2933b	Seq. ID No. 6169	Seq. ID No. 6170	BNR/Asp-box repeat
2941c	Seq. ID No. 6187	Seq. ID No. 6188	ABC transporter
2943d	Seq. ID No. 6195	Seq. ID No. 6196	ABC transporter
2954	Seq. ID No. 6219	Seq. ID No. 6220	Bacitracin resistance protein BacA
2955g	Seq. ID No. 6233	Seq. ID No. 6234	Permease family
2971a	Seq. ID No. 6269	Seq. ID No. 6270	ABC transporter
2974b	Seq. ID No. 6275	Seq. ID No. 6276	Predicted permease
2977a	Seq. ID No. 6279	Seq. ID No. 6280	Chromate transporter
2979	Seq. ID No. 6287	Seq. ID No. 6288	Chromate transporter
2980e	Seq. ID No. 6297	Seq. ID No. 6298	NQR2, RnfD, RnfE family
2984	Seq. ID No. 6299	Seq. ID No. 6300	Respiratory-chain NADH dehydrogenase
2986c	Seq. ID No. 6305	Seq. ID No. 6306	NQR2, RnfD, RnfE family
2988c	Seq. ID No. 6311	Seq. ID No. 6312	Respiratory-chain NADH dehydrogenase
3017	Seq. ID No. 6369	Seq. ID No. 6370	ABC transporter
3022	Seq. ID No. 6379	Seq. ID No. 6380	Clp amino terminal domain
3116	Seq. ID No. 6587	Seq. ID No. 6588	Peptidase C1-like family
3118b	Seq. ID No. 6591	Seq. ID No. 6592	Peptidase C1-like family

Listed in Table 8 are ORFs whose BlastP results predict for possible secreted, surface or membrane localization. Keywords used in the search are: MHC, murein, mycolic, NisP, penicillin, peptidoglycan, periplasmic, phosphatidate, pilus, protease, receptor, response regulator, sacculus, secreted protein, sensor protein, signal, surface, teichoic, toxin, transferring, transmembrane, virulence, vitronectin, wall, spor, sporulatio, immunoglobulin, IgG, IgE, IgM, IgD, cueat, teichoic, serum, transport, transporter, channel, porin, hemolysin, phosphatase, vaccine, polysaccharide, rhamnose, dexB, aliA, cap, cps, wze, wzh. A total of 319 ORFs whose BlastP results predict for a possible



secreted, surface or membrane localization for the polypeptides encoded by the ORFs are listed in Table 8.

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
4b	Seq. ID No. 9	Seq. ID No. 10	transport	transporter, <i>Bacillus halodurans</i> Bacteria; Firmicu...	4.00E-15
10	Seq. ID No. 17	Seq. ID No. 18	virulence	<i>Neisseria meningitidis</i> virulence pro... Aau72997...	5.00E-35
38a	Seq. ID No. 45	Seq. ID No. 46	porin	Cephalosporin C amidase enzyme. 3/1991 Aar10055...	6.00E-30
39a	Seq. ID No. 49	Seq. ID No. 50	capsular	PgsC, <i>Bacillus subtilis</i> Bacteria; Firmicutes; Baci...	1.00E-18
40	Seq. ID No. 53	Seq. ID No. 54	capB	CapB, <i>Bacillus subtilis</i> Bacteria; Firmicutes; Baci...	9.00E-95
41c	Seq. ID No. 59	Seq. ID No. 60	capA	PgsA, <i>Bacillus subtilis</i> Bacteria; Firmicutes; Baci...	2.00E-44
51c	Seq. ID No. 89	Seq. ID No. 90	membrane	putative transmembrane symporter, <i>Campylobacter je...</i>	2.00E-44
80c	Seq. ID No. 145	Seq. ID No. 146	transport	<i>Listeria monocytogenes</i> Bacteria; Firmicutes; Bacil...	6.00E-32
85c	Seq. ID No. 157	Seq. ID No. 158	envelop	<i>H. pylori</i> cell envelope transporter ... Aaw20861...	2.00E-50
88	Seq. ID No. 167	Seq. ID No. 168	TRANSMEMBRANE	PROBABLE TRANSMEMBRANE ABC TRANSPORTER PROTEIN, Ra...	2.00E-24
91a	Seq. ID No. 171	Seq. ID No. 172	membrane	outer membrane protein, <i>Xylella fastidiosa</i> 9a5c Ba...	5.00E-25

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
99	Seq. ID No. 191	Seq. ID No. 192	membrane	putative PTS transmembrane compon... AL096852...	8.00E-38
109d	Seq. ID No. 215	Seq. ID No. 216	membrane	High-affinity zinc uptake system membran, Fusobact...	2.00E-60
111a	Seq. ID No. 217	Seq. ID No. 218	transporter	YtgC, Bacillus subtilis Bacteria; Firmicutes; Baci...	7.00E-34
114	Seq. ID No. 225	Seq. ID No. 226	adhesin	surface adhesin A precursor, Bacillus halodurans B...	6.00E-42
124c	Seq. ID No. 239	Seq. ID No. 240	membrane	ABC transporter membrane-spanning permease, Strep...	1.00E-105
129c	Seq. ID No. 253	Seq. ID No. 254	immunogenic	Propionibacterium acnes immunogenic ... Aau44300...	5.00E-77
138b	Seq. ID No. 273	Seq. ID No. 274	transport	cadmium-transporting ATPase, Bacillus halodurans B...	1.00E-114
143	Seq. ID No. 277	Seq. ID No. 278	immunogenic	Propionibacterium acnes immunogenic ... Aau4245...	1.00E-14
145c	Seq. ID No. 289	Seq. ID No. 290	membrane	hypothetical integral membrane protein, Neisseria ...	1.00E-92
162b	Seq. ID No. 329	Seq. ID No. 330	membrane	putative ABC transporter membrane-spannin, Strepto...	2.00E-58
165b	Seq. ID No. 343	Seq. ID No. 344	transport	ABC transporter ATP-binding protein, Lactococcus l...	7.00E-90
167	Seq. ID No. 345	Seq. ID No. 346	transport	putative ABC transporter, Enterococcus faecium Bac...	5.00E-99

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
180b	Seq. ID No. 375	Seq. ID No. 376	membrane	preprotein translocase, SecY subunit, Streptococcu...	1.00E-101
245c	Seq. ID No. 501	Seq. ID No. 502	transporter	uracil permease, Bacillus caldolyticus Bacteria; F...	2.00E-80
246b	Seq. ID No. 505	Seq. ID No. 506	sporulation	stage V sporulation protein E, Bacillus halodurans...	3.00E-46
248b	Seq. ID No. 511	Seq. ID No. 512	sporulation	stage V sporulation protein E, Bacillus halodurans...	3.00E-46
249b	Seq. ID No. 515	Seq. ID No. 516	peptidoglycan	putative peptidoglycan GlcNAc deacetylase, Strepto...	4.00E-47
255c	Seq. ID No. 529	Seq. ID No. 530	transporter	putative sodium/glucose cotransporter, Salmonella ...	1.00E-52
273b	Seq. ID No. 569	Seq. ID No. 570	immunogenic	Propionibacterium acnes immunogenic ... Aau41330...	5.00E-56
277c	Seq. ID No. 575	Seq. ID No. 576	lipoprotein	Listeria monocytogenes Bacteria; Firmicutes; Bacil...	4.00E-91
283b	Seq. ID No. 593	Seq. ID No. 594	transport	probable amino acid ABC transporter, Clostridium p...	3.00E-19
284a	Seq. ID No. 595	Seq. ID No. 596	membrane	membrane protein, Vibrio harveyi Bacteria; Proteob...	5.00E-39
311	Seq. ID No. 637	Seq. ID No. 638	transporter	ABC transporter (ATP-binding protein), Bacillus ha...	5.00E-58
318b	Seq. ID No. 659	Seq. ID No. 660	lipoprotein	PUTATIVE OUTER MEMBRANE LIPOPROTEIN, Sinorhizobium ...	4.00E-34

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
321	Seq. ID No. 669	Seq. ID No. 670	lipoprotein	Staphylococcus aureus subsp. aureus MW2 Bacteria; ...	1.00E-54
324	Seq. ID No. 675	Seq. ID No. 676	lipoprotein	Staphylococcus aureus subsp. aureus MW2 Bacteria; ...	1.00E-55
327c	Seq. ID No. 681	Seq. ID No. 682	transport	ABC transporter, permease protein, putative, Strep...	9.00E-36
342h	Seq. ID No. 729	Seq. ID No. 730	transmembrane	putative transmembrane efflux protein, Methanosarc...	1.00E-33
358b	Seq. ID No. 779	Seq. ID No. 780	transport	transport protein, Fusobacterium nucleatum subsp. ...	1.00E-119
382b	Seq. ID No. 819	Seq. ID No. 820	secreted protein	putative secreted protein, Listeria innocua Bacter...	2.00E-37
418b	Seq. ID No. 895	Seq. ID No. 896	transport	metal transporting ATPase, Lactococcus lactis subs...	1.00E-138
427a	Seq. ID No. 921	Seq. ID No. 922	capsular	unknown, Staphylococcus aureus Bacteria; Firmicute...	1.00E-46
431	Seq. ID No. 935	Seq. ID No. 936	protease	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	2.00E-41
441b	Seq. ID No. 955	Seq. ID No. 956	response regulator	histidine kinase YycG, Staphylococcus aureus Bacte...	1.00E-135
448	Seq. ID No. 967	Seq. ID No. 968	transporter	accessory protein, Enterococcus faecalis subsp. li...	1.00E-17
452e	Seq. ID No. 985	Seq. ID No. 986	transporter	membrane subunit, Enterococcus faecalis subsp. liq...	8.00E-55

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
464d	Seq. ID No. 1017	Seq. ID No. 1018	membrane	Trk transporter membrane-spanning protein - K, Str...	4.00E-82
472f	Seq. ID No. 1039	Seq. ID No. 1040	membrane	potassium uptake protein, Trk family, Streptococcu...	1.00E-73
492	Seq. ID No. 1075	Seq. ID No. 1076	lipoprotein	putative outer membrane lipoprotein, Salmonella ty...	4.00E-28
499a	Seq. ID No. 1089	Seq. ID No. 1090	phosphatase	Exopolyphosphatase -related proteins, Thermoanaerob...	1.00E-110
524b	Seq. ID No. 1137	Seq. ID No. 1138	sporulation	stage III sporulation, Bacillus subtilis Bacteria;...	4.00E-38
561	Seq. ID No. 1223	Seq. ID No. 1224	membrane	ABC transporter ATP-binding/membrane spannin, Stre...	2.00E-63
573	Seq. ID No. 1241	Seq. ID No. 1242	transport	ABC-type multidrug/protein/lipid transport, Thermoa...	2.00E-61
609a	Seq. ID No. 1315	Seq. ID No. 1316	spore	spore wall protein 2 precursor, Encephalitozoon in...	6.00E-23
613d	Seq. ID No. 1331	Seq. ID No. 1332	TRANSMEMBRANE	HYPOTHETICAL TRANSMEMBRANE PROTEIN, Ralstonia sola...	5.00E-13
631d	Seq. ID No. 1369	Seq. ID No. 1370	Signal	PROBABLE 5'-NUCLEOTIDASE PRECURSOR (SIGNAL, Sinorhi...	4.00E-60
687	Seq. ID No. 1459	Seq. ID No. 1460	transmembrane	Chlamydia pneumoniae transmembrane p... Aay34923...	6.00E-45
722c	Seq. ID No. 1517	Seq. ID No. 1518	immunogenic	Propionibacterium acnes immunogenic ... Aau6647...	3.00E-16

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
743b	Seq. ID No. 1561	Seq. ID No. 1562	transport	putative alpha-glucosidase, Alicyclobacillus acido...	2.00E-27
744	Seq. ID No. 1563	Seq. ID No. 1564	transport	Glycerol-3-phosphate ABC-transporter, Clostridium ...	1.00E-93
745b	Seq. ID No. 1567	Seq. ID No. 1568	transport	Glycerol-3-phosphate ABC-transporter, permeas, Clo...	2.00E-49
746b	Seq. ID No. 1571	Seq. ID No. 1572	transport	glycerol-3-phosphate ABC transporter (permease), B...	1.00E-51
747	Seq. ID No. 1573	Seq. ID No. 1574	transport	Multiple sugar-binding ABC-transporter, MSM, Clost...	2.00E-95
762b	Seq. ID No. 1601	Seq. ID No. 1602	cpsL	transposase, Streptococcus pneumoniae Bacteria; Fi...	5.00E-44
763b	Seq. ID No. 1607	Seq. ID No. 1608	capsular	transposase, Staphylococcus aureus Bacteria; Firmi...	4.00E-16
767	Seq. ID No. 1613	Seq. ID No. 1614	capsular	transposase, Staphylococcus aureus Bacteria; Firmi...	4.00E-14
770c	Seq. ID No. 1619	Seq. ID No. 1620	transport	acetylornitine deacetylase, Bacillus subtilis Bact...	2.00E-32
785	Seq. ID No. 1641	Seq. ID No. 1642	phosphatase	phosphatase, Lactococcus lactis subsp. lactis Bact...	9.00E-29
788b	Seq. ID No. 1647	Seq. ID No. 1648	transport	Staphylococcus aureus subsp. aureus MW2 Bacteria; ...	1.00E-19
789c	Seq. ID No. 1653	Seq. ID No. 1654	transport	Staphylococcus aureus subsp. aureus MW2 Bacteria; ...	3.00E-31

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
792	Seq. ID No. 1657	Seq. ID No. 1658	transport	Staphylococcus aureus subsp. aureus N315 Bacteria;...	2.00E-87
794d	Seq. ID No. 1665	Seq. ID No. 1666	transporter	alkylphosphonate ABC tranporte, Bacillus haloduran...	4.00E-26
813	Seq. ID No. 1699	Seq. ID No. 1700	transporter	cadmium resistance transporter, putative, Streptoc...	3.00E-57
830	Seq. ID No. 1713	Seq. ID No. 1714	cpsA	Thermostable carboxypeptidase (cpsA-2), Sulfolobus...	1.00E-50
851b	Seq. ID No. 1751	Seq. ID No. 1752	penicillin	B. lactofermentum penicillin binding... Aay33117...	3.00E-23
859d	Seq. ID No. 1771	Seq. ID No. 1772	transport	putative cation transporting P-ty... AF067954...	1.00E-146
866b	Seq. ID No. 1785	Seq. ID No. 1786	membrane	ATPase, Bacillus subtilis Bacteria; Firmicutes; GE...	1.00E-124
868b	Seq. ID No. 1789	Seq. ID No. 1790	transporter	betaine ABC transporter permease and substrat, Lac...	1.00E-71
870	Seq. ID No. 1791	Seq. ID No. 1792	transporter	Pseudogene, similar to glycine-betaine bindin, Lis...	1.00E-80
873c	Seq. ID No. 1797	Seq. ID No. 1798	transporter	Pseudogene, similar to glycine-betaine bindin, Lis...	2.00E-73
878c	Seq. ID No. 1811	Seq. ID No. 1812	hemolysin	Alpha-hemolysin, Fusobacterium nucleatum subsp. nu...	1.00E-20
880c	Seq. ID No. 1817	Seq. ID No. 1818	response regulator	putative response regulator, Lactobacillus sakei B...	5.00E-76
885	Seq. ID No. 1819	Seq. ID No. 1820	response regulator	putative histidine kinase, Lactobacillus sakei Bac...	1.00E-82

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
886	Seq. ID No. 1821	Seq. ID No. 1822	penicillin	D-alanine carboxypeptidase (PBP-5), <i>Bacillus subti...</i>	4.00E-55
929b	Seq. ID No. 1871	Seq. ID No. 1872	membrane	PROBABLE BIFUNCTIONAL, <i>Ralstonia solanacearum</i> Bac...	1.00E-117
939c	Seq. ID No. 1895	Seq. ID No. 1896	transporter	branch-chain amino acid transporter, <i>Bacillus subti...</i>	3.00E-64
946	Seq. ID No. 1905	Seq. ID No. 1906	phosphatase	deoxyuridine 5'-triphosphate nucleotidhydrolase, L...	3.00E-30
949d	Seq. ID No. 1913	Seq. ID No. 1914	PROTEASE	PROBABLE ATP-DEPENDENT PROTEASE, ... AL646064...	1.00E-101
951b	Seq. ID No. 1919	Seq. ID No. 1920	transporter	Pseudogene, similar to glycine-betaine bindin, Lis...	4.00E-76
952b	Seq. ID No. 1923	Seq. ID No. 1924	Membrane	Membrane-associated protein containing a homolo, C...	3.00E-68
972b	Seq. ID No. 1965	Seq. ID No. 1966	phosphatase	exopolyphosphatase, <i>Bacillus halodurans</i> Bacteria; ...	3.00E-60
977b	Seq. ID No. 1971	Seq. ID No. 1972	lipoprotein	PUTATIVE OUTER MEMBRANE LIPOPROTEIN, <i>Sinorhizobium</i> ...	1.00E-50
988d	Seq. ID No. 1999	Seq. ID No. 2000	membrane	putative conserved membrane protein, <i>Listeria mono...</i>	3.00E-35
1016c	Seq. ID No. 2047	Seq. ID No. 2048	transporter	Na <sup>+</sup> ABC transporter (ATP-binding protein), NATA, C...	1.00E-41
1017d	Seq. ID No. 2055	Seq. ID No. 2056	transporter	Na <sup>+</sup> ABC transporter, NATB, <i>Clostridium acetobutyli...</i>	2.00E-17



TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
1036c	Seq. ID No. 2091	Seq. ID No. 2092	transporter	Listeria monocytogenes Bacteria; Firmicutes; Bacil...	1.00E-126
1037	Seq. ID No. 2093	Seq. ID No. 2094	transporter	Glutamine ABC transporter (ATP- binding protein), C...	1.00E-93
1047b	Seq. ID No. 2115	Seq. ID No. 2116	adhesion	YcdH, Bacillus subtilis Bacteria; Firmicutes; Baci...	3.00E-35
1049b	Seq. ID No. 2119	Seq. ID No. 2120	transporter	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	8.00E-92
1050d	Seq. ID No. 2127	Seq. ID No. 2128	membrane	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	4.00E-71
1070b	Seq. ID No. 2165	Seq. ID No. 2166	sporulation	stage V sporulation protein C (peptidyl- tRN, Bacil...	3.00E-47
1077e	Seq. ID No. 2179	Seq. ID No. 2180	membrane	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	3.00E-53
1094b	Seq. ID No. 2207	Seq. ID No. 2208	membrane	S. pneumoniae putative ATPase involved in membrane...	0
1100	Seq. ID No. 2223	Seq. ID No. 2224	transporter	probable ABC transporter, Clostridium perfringens ...	9.00E-27
1101b	Seq. ID No. 2227	Seq. ID No. 2228	transporter	ABC transporter ATP-binding protein, Xanthomonas a...	2.00E-15
1111c	Seq. ID No. 2241	Seq. ID No. 2242	membrane	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	2.00E-49
1127	Seq. ID No. 2253	Seq. ID No. 2254	transporter	ABC transporter ATP-binding protein, Clostridium a...	7.00E-35
1135b	Seq. ID No. 2263	Seq. ID No. 2264	lipoprotein	putative lipoprotein, Streptomyces coelicolor A3(2...	5.00E-29

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
1138	Seq. ID No. 2269	Seq. ID No. 2270	capsular	unknown, Staphylococcus aureus Bacteria; Firmicute...	9.00E-60
1140c	Seq. ID No. 2275	Seq. ID No. 2276	transport	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	2.00E-85
1149	Seq. ID No. 2301	Seq. ID No. 2302	transporter	putative ABC-transporter ATP-bind... AL627273...	1.00E-106
1152g	Seq. ID No. 2315	Seq. ID No. 2316	transporter	dipeptide ABC transporter, permease protei, Helico...	1.00E-49
1155g	Seq. ID No. 2329	Seq. ID No. 2330	transporter	Staphylococcus aureus subsp. aureus MW2 Bacteria; ...	3.00E-80
1158b	Seq. ID No. 2333	Seq. ID No. 2334	lipoprotein	RGD-containing lipoprotein, Staphylococcus aureus ...	2.00E-94
1165	Seq. ID No. 2343	Seq. ID No. 2344	peptidoglycan	peptidoglycan lytic protein P45, Listeria innocua ...	1.00E-29
1166	Seq. ID No. 2345	Seq. ID No. 2346	Response regulator	Response regulator (CheY-like domain, HT, Clostrid...	1.00E-42
1171c	Seq. ID No. 2363	Seq. ID No. 2364	membrane	ABC-type transmembrane transport protein, Campylob...	1.00E-20
1177	Seq. ID No. 2373	Seq. ID No. 2374	capsular	capsular polysaccharide biosynthesi... U67548...	3.00E-11
1180e	Seq. ID No. 2391	Seq. ID No. 2392	wall	unknown protein, Streptococcus mutans Bacteria; Fi...	3.00E-66
1191	Seq. ID No. 2417	Seq. ID No. 2418	transporter	putative ABC transporter (ATP-binding protein), St...	3.00E-70

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
1197	Seq. ID No. 2429	Seq. ID No. 2430	Periplasmic	Periplasmic serine proteases (ClpP class), Thermoa...	2.00E-37
1214	Seq. ID No. 2465	Seq. ID No. 2466	protease	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	4.00E-35
1218b	Seq. ID No. 2475	Seq. ID No. 2476	protease	glycoprotease family protein, Streptococcus pneumo...	1.00E-115
1221b	Seq. ID No. 2483	Seq. ID No. 2484	transporter	hypothetical ABC transporter ATP- bindin, Staphyloc...	1.00E-155
1233c	Seq. ID No. 2513	Seq. ID No. 2514	transporter	putative ATP-binding component of a transpor, Esch...	6.00E-26
1237	Seq. ID No. 2525	Seq. ID No. 2526	wall	YocH, Bacillus subtilis Bacteria; Firmicutes; Baci...	4.00E-14
1258d	Seq. ID No. 2589	Seq. ID No. 2590	transporter	P-type ATPase - calcium transporter, Streptococcus...	1.00E-159
1271	Seq. ID No. 2613	Seq. ID No. 2614	transporter	Mel, Streptococcus pneumoniae Bacteria; Firmicutes...	4.00E-99
1288	Seq. ID No. 2651	Seq. ID No. 2652	membrane	membrane bound protein, Bacillus subtilis Bacteria...	3.00E-42
1300	Seq. ID No. 2669	Seq. ID No. 2670	transport	secretory protein for transport of ... X65961...	1.00E-121
1305c	Seq. ID No. 2677	Seq. ID No. 2678	transporter	cell division ABC transporter, ATP- bindin, Strepto...	7.00E-81
1308e	Seq. ID No. 2687	Seq. ID No. 2688	transporter	cell division ABC transporter, permease protei, St...	4.00E-47
1311	Seq. ID No. 2689	Seq. ID No. 2690	response regulator	two-component response regulator involved i, Bacil...	3.00E-79

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
1315	Seq. ID No. 2693	Seq. ID No. 2694	Membrane	Membrane-associated sensory histi... AE007774...	1.00E-36
1319b	Seq. ID No. 2703	Seq. ID No. 2704	membrane	ABC transporter membrane-spanning permease, Strep...	7.00E-90
1320c	Seq. ID No. 2709	Seq. ID No. 2710	transmembrane	phosphate ABC transporter, permease protein, Strep...	1.00E-78
1322b	Seq. ID No. 2715	Seq. ID No. 2716	transport	Listeria monocytogenes Bacteria; Firmicutes; Bacil...	1.00E-29
1344b	Seq. ID No. 2751	Seq. ID No. 2752	lipoprotein	putative HPr(ser) kinase, Streptococcus mutans Bac...	8.00E-79
1348	Seq. ID No. 2753	Seq. ID No. 2754	lipoprotein	Listeria monocytogenes Bacteria; Firmicutes; Bacil...	2.00E-66
1355	Seq. ID No. 2767	Seq. ID No. 2768	Capsular	Capsular polysaccharide of Streptoco... Aar83041...	1.00E-103
1366b	Seq. ID No. 2787	Seq. ID No. 2788	protease	protease ClpP, Listeria monocytogenes Bacteria; Fi...	1.00E-81
1368	Seq. ID No. 2791	Seq. ID No. 2792	receptor	plasmin receptor, Streptococcus pyogenes Bacteria;...	1.00E-100
1377	Seq. ID No. 2803	Seq. ID No. 2804	iron	enolase, Spironucleus vortens Euk... AF159517...	2.00E-66
1408	Seq. ID No. 2867	Seq. ID No. 2868	transporter	ABC transporter, Lactobacillus plantarum Bacteria;...	1.00E-116
1410	Seq. ID No. 2871	Seq. ID No. 2872	transport	bacillus subtilis. hypothetical abc transporter at...	1.00E-39

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
1426b	Seq. ID No. 2907	Seq. ID No. 2908	polysaccharide	Orfde2, Enterococcus faecalis Bacteria; Firmicutes...	3.00E-24
1431	Seq. ID No. 2919	Seq. ID No. 2920	transporter	Bacillus subtilis Bacteria; Firmicutes; Bacillus/C...	1.00E-100
1432	Seq. ID No. 2921	Seq. ID No. 2922	transporter	predicted membrane components of a, Thermoanaeroba...	3.00E-38
1433	Seq. ID No. 2923	Seq. ID No. 2924	immunogenic	Propionibacterium acnes immunogenic ... Aau55208...	1.00E-111
1434b	Seq. ID No. 2927	Seq. ID No. 2928	iron	Bacillus subtilis Bacteria; Firmicutes; Bacillus/C...	8.00E-37
1437c	Seq. ID No. 2933	Seq. ID No. 2934	transporter	ABC transporter subunit, Synechocys... D64004...	1.00E-102
1442b	Seq. ID No. 2957	Seq. ID No. 2958	transporter	ABC transporter (ATP-binding protein), Bacillus ha...	2.00E-47
1451	Seq. ID No. 2979	Seq. ID No. 2980	transporter	ABC transporter, ATP-binding protein, Streptococcu...	1.00E-23
1457c	Seq. ID No. 2999	Seq. ID No. 3000	transporter	Na/Pi cotransporter II-related protein, Streptococ...	1.00E-118
1462b	Seq. ID No. 3005	Seq. ID No. 3006	transporter	probable ABC transporter (ATP-binding protein), Ye...	1.00E-111
1466d	Seq. ID No. 3019	Seq. ID No. 3020	membrane	ABC transporter ATP-binding/membrane spannin, Stre...	1.00E-115
1470b	Seq. ID No. 3031	Seq. ID No. 3032	membrane	Integral membrane protein, Fusobacterium nucleatum...	2.00E-11

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
1471	Seq. ID No. 3035	Seq. ID No. 3036	channel	potassium channel protein, Methanosarcina acetivor...	6.00E-20
1479c	Seq. ID No. 3055	Seq. ID No. 3056	wall	Listeria monocytogenes Bacteria; Firmicutes; Bacil...	2.00E-15
1484c	Seq. ID No. 3067	Seq. ID No. 3068	transporter	magnesium (Mg2+) transporter, Bacillus halodurans ...	2.00E-65
1488g	Seq. ID No. 3085	Seq. ID No. 3086	transporter	Staphylococcus aureus subsp. aureus N315 Bacteria;...	2.00E-55
1530b	Seq. ID No. 3165	Seq. ID No. 3166	peptidoglycan	Penicillin-binding protein 1b, Streptococcus pneum...	1.00E-120
1543	Seq. ID No. 3183	Seq. ID No. 3184	invasion	extracellular protein, Listeria welshimeri Bacteri...	2.00E-26
1547b	Seq. ID No. 3189	Seq. ID No. 3190	spore	Bacillus subtilis Bacteria; Firmicutes; Bacillus/C...	2.00E-71
1553b	Seq. ID No. 3197	Seq. ID No. 3198	transporter	putative ABC transporter subunit ComYA, Streptococ...	3.00E-55
1556c	Seq. ID No. 3211	Seq. ID No. 3212	transporter	Na+ ABC transporter (ATP-binding protein), NATA, C...	1.00E-36
1573	Seq. ID No. 3251	Seq. ID No. 3252	transporter	ABC transporter, ATP-binding protein, Streptococcu...	2.00E-42
1577b	Seq. ID No. 3257	Seq. ID No. 3258	transport	drug efflux ABC transporter, Streptococcus pneumon...	7.00E-12
1578	Seq. ID No. 3259	Seq. ID No. 3260	transport	ABC transporter, Lactobacillus helveticus Bacteria...	7.00E-34

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
1594a	Seq. ID No. 3297	Seq. ID No. 3298	transmembrane	Chlamydia pneumoniae transmembrane p... Aay35379...	9.00E-22
1606b	Seq. ID No. 3319	Seq. ID No. 3320	response regulator	putative histidine protein kinase, Lactococcus lac...	4.00E-69
1607b	Seq. ID No. 3323	Seq. ID No. 3324	lipoprotein	YqjG, Bacillus subtilis Bacteria; Firmicutes; Baci...	7.00E-30
1616b	Seq. ID No. 3335	Seq. ID No. 3336	sporulation	Staphylococcus aureus subsp. aureus MW2 Bacteria; ...	1.00E-156
1619	Seq. ID No. 3337	Seq. ID No. 3338	lipoprotein	CD4+ T cell-stimulating antigen, lipoprotein, List...	4.00E-81
1625c	Seq. ID No. 3355	Seq. ID No. 3356	transport	putative sugar ABC transporter (permeas, Streptoco...	3.00E-76
1626b	Seq. ID No. 3359	Seq. ID No. 3360	membrane	sugar ABC transporter, permease protein, Streptoco...	7.00E-97
1634c	Seq. ID No. 3377	Seq. ID No. 3378	peptidoglycan	beta-1,4-N-acetylmuramoylhydr olase, Enterococcus h...	4.00E-34
1646e	Seq. ID No. 3397	Seq. ID No. 3398	polysaccharide	putative polysaccharide biosynthesis protein, Stre...	3.00E-78
1649a	Seq. ID No. 3405	Seq. ID No. 3406	penicillin	Streptococcus thermophilus Bacteria; Firmicutes; G...	7.00E-35
1654	Seq. ID No. 3415	Seq. ID No. 3416	immunogenic	Propionibacterium acnes immunogenic ... Aau49489...	8.00E-24
1659c	Seq. ID No. 3425	Seq. ID No. 3426	membrane	putative integral membrane protein, Campylobacter ...	2.00E-93

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
1660b	Seq. ID No. 3427	Seq. ID No. 3428	membrane	putative integral membrane protein, Campylobacter ...	1.00E-24
1674	Seq. ID No. 3461	Seq. ID No. 3462	membrane	putative integral membrane protein, Campylobacter ...	9.00E-15
1675a	Seq. ID No. 3463	Seq. ID No. 3464	immunogenic	Propionibacterium acnes immunogenic ... Aau47623...	3.00E-24
1685	Seq. ID No. 3487	Seq. ID No. 3488	immunogenic	Propionibacterium acnes immunogenic ... Aau58232...	2.00E-50
1688b	Seq. ID No. 3493	Seq. ID No. 3494	polysaccharide	Orfde3, Enterococcus faecalis Bacteria; Firmicutes...	5.00E-87
1689a	Seq. ID No. 3497	Seq. ID No. 3498	cps7H	putative glycosyltransferase Cps7H, Streptococcus ...	5.00E-38
1691	Seq. ID No. 3507	Seq. ID No. 3508	membrane	Hypothetical membrane-spanning protein, Fusobacter...	6.00E-12
1694d	Seq. ID No. 3519	Seq. ID No. 3520	membrane	membrane bound protein, Bacillus subtilis Bacteria...	1.00E-68
1696	Seq. ID No. 3521	Seq. ID No. 3522	transport	UDP-Glc-6-dehydrogenase Ugd, Escherichia coli Bact...	1.00E-155
1699b	Seq. ID No. 3529	Seq. ID No. 3530	transport	probable export protein, Escherichia coli K12 Bact...	4.00E-28
1701a	Seq. ID No. 3535	Seq. ID No. 3536	immunogenic	Propionibacterium acnes immunogenic ... Aau67497...	4.00E-34
1752b	Seq. ID No. 3629	Seq. ID No. 3630	surface	streptococcal surface protein, Streptococcus dysga...	7.00E-14



TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
1756b	Seq. ID No. 3635	Seq. ID No. 3636	membrane	hypothetical membrane protein LaaO, Lactobacillus ...	1.00E-31
1798c	Seq. ID No. 3727	Seq. ID No. 3728	membrane	Uncharacterized membrane protein, homolog o, Clost...	1.00E-13
1808d	Seq. ID No. 3759	Seq. ID No. 3760	membrane	mbh8 NADH dehydrogenase subunit - integra, Pyrococ...	7.00E-43
1809f	Seq. ID No. 3771	Seq. ID No. 3772	membrane	mbh8 NADH dehydrogenase subunit - integra, Pyrococ...	2.00E-48
1816a	Seq. ID No. 3793	Seq. ID No. 3794	peptidoglycan	Penicillin-binding protein 1A, Streptococcus pneum...	1.00E-124
1838b	Seq. ID No. 3839	Seq. ID No. 3840	transport	ABC-type multidrug/protein/lipi d transpor, Thermoa...	6.00E-57
1842b	Seq. ID No. 3851	Seq. ID No. 3852	protease	sac operon related regulation protein, Bacillus sp...	1.00E-22
1845c	Seq. ID No. 3863	Seq. ID No. 3864	channel	voltage-gated chloride channel family protein, Str...	4.00E-63
1848a	Seq. ID No. 3865	Seq. ID No. 3866	membrane	Integral membrane protein, Fusobacterium nucleatum...	6.00E-24
1855	Seq. ID No. 3883	Seq. ID No. 3884	capsule	Regulatory function on capsule ex... AE008458...	1.00E-13
1857c	Seq. ID No. 3891	Seq. ID No. 3892	polysaccharide	Staphylococcus aureus subsp. aureus N315 Bacteria;...	7.00E-15
1865b	Seq. ID No. 3913	Seq. ID No. 3914	membrane	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	2.00E-40

TABLE 8: BLASTP

ORF Number	DNA Seq ID Number	Protein Seq ID Number	Keyword	Description	Blast 'e' Value
1873c	Seq. ID No. 3925	Seq. ID No. 3926	protease	OrfRM1, Bacillus subtilis Bacteria; Firmicutes; GE... ref[NP_655047.1] (NC_003995)	8.00E-91
1875c	Seq. ID No. 3929	Seq. ID No. 3930	Signal	Peptidase_S26, Signal...	1.00E-32
1898b	Seq. ID No. 3975	Seq. ID No. 3976	membrane	Hypothetical membrane-spanning protein, Fusobacter...	6.00E-32
1902a	Seq. ID No. 3981	Seq. ID No. 3982	capsular	DNA topoisomerase IV subunit B, Streptococcus agal...	0
1931b	Seq. ID No. 4027	Seq. ID No. 4028	transport	transporter protein, Haemophilus influenzae Rd Bac...	3.00E-22
1936	Seq. ID No. 4039	Seq. ID No. 4040	transport	Bacillus subtilis Bacteria; Firmicutes; Bacillus/C...	2.00E-18
1941b	Seq. ID No. 4061	Seq. ID No. 4062	Membrane	Membrane associated histidine kinase-lik, Clostrid...	6.00E-18
1946b	Seq. ID No. 4073	Seq. ID No. 4074	transport	probable amino acid transport protein, Clostridium...	2.00E-56
1951a	Seq. ID No. 4081	Seq. ID No. 4082	membrane	ABC-type multidrug/protein/lipid transport, Clostri...	1.00E-137
1958b	Seq. ID No. 4103	Seq. ID No. 4104	membrane	ABC transporter membrane-spanning permease, Strep...	8.00E-44
1960c	Seq. ID No. 4111	Seq. ID No. 4112	transport	ABC transporter substrate-binding protein, Strep...	3.00E-68
1973	Seq. ID No. 4137	Seq. ID No. 4138	peptidoglycan	peptidoglycan N-acetylglucosamine deacetylase A, S...	1.00E-15
2016c	Seq. ID No. 4225	Seq. ID No. 4226	transport	Listeria monocytogenes Bacteria; Firmicutes; Bacil...	2.00E-20

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
2024b	Seq. ID No. 4247	Seq. ID No. 4248	penicillin	Listeria monocytogenes Bacteria; Firmicutes; Bacil...	1.00E-132
2074b	Seq. ID No. 4343	Seq. ID No. 4344	wall	Bacillus subtilis Bacteria; Firmicutes; Bacillus/C...	2.00E-26
2092	Seq. ID No. 4379	Seq. ID No. 4380	response regulator	Hpk1, Streptococcus thermophilus Bacteria; Firmicu...	2.00E-22
2096c	Seq. ID No. 4389	Seq. ID No. 4390	transport	Staphylococcus aureus subsp. aureus MW2 Bacteria; ...	1.00E-61
2140a	Seq. ID No. 4469	Seq. ID No. 4470	protease	Listeria innocua Bacteria; Firmicutes; Bacillus/Cl...	6.00E-55
2142a	Seq. ID No. 4473	Seq. ID No. 4474	phosphatidate	putative phosphatidate cytidyltransferase, Strept...	1.00E-11
2146	Seq. ID No. 4481	Seq. ID No. 4482	lipoprotein	Listeria innocua Bacteria; Firmicutes; Bacillus/Cl...	1.00E-68
2147b	Seq. ID No. 4485	Seq. ID No. 4486	transport	Listeria monocytogenes Bacteria; Firmicutes; Bacil...	5.00E-41
2150a	Seq. ID No. 4493	Seq. ID No. 4494	immunogenic	Propionibacterium acnes immunogenic protein #18988...	9.00E-15
2161c	Seq. ID No. 4529	Seq. ID No. 4530	immunogenic	Propionibacterium acnes immunogenic protein #20073...	5.00E-12
2219c	Seq. ID No. 4643	Seq. ID No. 4644	membrane	Conserved membrane protein, probabl, Clostridium a...	4.00E-20
2249	Seq. ID No. 4705	Seq. ID No. 4706	transport	oligopeptide ABC transporte, Bacillus halodurans B...	1.00E-148

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
2253d	Seq. ID No. 4713	Seq. ID No. 4714	transport	oligopeptide ABC transporter (permease), Bacillus ...	1.00E-60
2255b	Seq. ID No. 4717	Seq. ID No. 4718	transport	oligopeptide ABC transporter (permease), Bacillus ...	8.00E-93
2300	Seq. ID No. 4813	Seq. ID No. 4814	transport	H <sup>+</sup> -transporting ATP synthase, subunit K (atpK), Me...	2.00E-18
2301	Seq. ID No. 4815	Seq. ID No. 4816	transport	H <sup>+</sup> -transporting ATP synthase, subunit I (atpI), Py...	3.00E-43
2307	Seq. ID No. 4825	Seq. ID No. 4826	membrane	membrane permease OpuCD, Listeria monocytogenes Ba...	1.00E-55
2308	Seq. ID No. 4827	Seq. ID No. 4828	transport	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	5.00E-81
2309c	Seq. ID No. 4833	Seq. ID No. 4834	transport	membrane permease OpuCB, Listeria monocytogenes Ba...	9.00E-33
2311	Seq. ID No. 4837	Seq. ID No. 4838	transport	glycine betaine/carnitine/cho line AB, Staphylococc...	1.00E-109
2317	Seq. ID No. 4851	Seq. ID No. 4852	immunogenic	Propionibacterium acnes immunogenic protein #7465....	9.00E-17
2324	Seq. ID No. 4863	Seq. ID No. 4864	immunogenic	Propionibacterium acnes immunogenic protein #5020....	5.00E-18
2329d	Seq. ID No. 4875	Seq. ID No. 4876	membrane	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	2.00E-72
2331	Seq. ID No. 4879	Seq. ID No. 4880	membrane	Listeria monocytogenes Bacteria; Firmicutes; Bacil...	1.00E-28

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
2338c	Seq. ID No. 4893	Seq. ID No. 4894	membrane	predicted membrane GTPase involved in stres, Therm...	1.00E-178
2344	Seq. ID No. 4901	Seq. ID No. 4902	membrane	dihydrolipoamide dehydrogenase component o, Staphy...	1.00E-167
2357	Seq. ID No. 4919	Seq. ID No. 4920	sensor protein	sensor protein kinase, Lactococcus lactis subsp. l...	1.00E-47
2363b	Seq. ID No. 4931	Seq. ID No. 4932	periplasmic	predicted periplasmic solute-binding protein, Ther...	4.00E-45
2376	Seq. ID No. 4959	Seq. ID No. 4960	virulence	aspartate semialdehyde dehydrogenase, Staphylococc...	1.00E-117
2377b	Seq. ID No. 4963	Seq. ID No. 4964	virulence	Staphylococcus aureus mutant P14C15 virulence gene...	2.00E-87
2387	Seq. ID No. 4985	Seq. ID No. 4986	Transport	Transporter, Fusobacterium nucleatum subsp. nuclea...	9.00E-40
2452	Seq. ID No. 5113	Seq. ID No. 5114	sporulation	alanine dehydrogenase, Bacillus subtilis Bacteria;...	1.00E-118
2453	Seq. ID No. 5115	Seq. ID No. 5116	ferric	Bacillus subtilis Bacteria; Firmicutes; Bacillus/C...	5.00E-48
2455	Seq. ID No. 5117	Seq. ID No. 5118	ferric	Bacillus subtilis Bacteria; Firmicutes; Bacillus/C...	2.00E-76
2456d	Seq. ID No. 5125	Seq. ID No. 5126	transport	Bacillus subtilis Bacteria; Firmicutes; Bacillus/C...	2.00E-54
2458g	Seq. ID No. 5141	Seq. ID No. 5142	transporter	ferrichrome ABC transporter (permease), Bacillus h...	2.00E-65

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
				Human secreted protein sequence enco...	
2475c	Seq. ID No. 5183	Seq. ID No. 5184	secreted protein	Aab34842...	1.00E-109
2485	Seq. ID No. 5201	Seq. ID No. 5202	wall	cell division protein, Enterococcus faecalis Bacte...	1.00E-114
2490	Seq. ID No. 5205	Seq. ID No. 5206	wall	cell division protein, Enterococcus faecalis Bacte...	5.00E-22
2495a	Seq. ID No. 5213	Seq. ID No. 5214	penicillin	MRAY, Staphylococcus aureus Bacteria; Firmicutes; ...	6.00E-64
2497b	Seq. ID No. 5219	Seq. ID No. 5220	wall	penicillin-binding protein, Enterococcus faecalis ...	1.00E-116
2520d	Seq. ID No. 5279	Seq. ID No. 5280	phosphatase	phosphoenolpyruvat e-protein phosphatase, Staphyloc...	0
2525a	Seq. ID No. 5285	Seq. ID No. 5286	virulence	Amino acid sequence of a virulence factor encoded ...	3.00E-11
2547c	Seq. ID No. 5331	Seq. ID No. 5332	immunogenic	Propionibacterium acnes immunogenic protein #22248...	2.00E-14
2564d	Seq. ID No. 5381	Seq. ID No. 5382	transport	carboxypeptidase, Bacillus subtilis Bacteria; Firm...	1.00E-42
2568	Seq. ID No. 5389	Seq. ID No. 5390	transport	ABC-type multidrug transport system, ATPas, Thermo...	2.00E-47
2582a	Seq. ID No. 5405	Seq. ID No. 5406	membrane	ABC transporter membrane-spanning permease , Strep...	9.00E-66
2585	Seq. ID No. 5411	Seq. ID No. 5412	transport	ABC transporter ATP-binding protein - cobal, Strep...	1.00E-148

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
2589	Seq. ID No. 5419	Seq. ID No. 5420	lipoprotein	Chlamydia trachomatis lipoprotein se... Aay37627...	1.00E-120
2596	Seq. ID No. 5433	Seq. ID No. 5434	immunogenic	Propionibacterium acnes immunogenic protein #4493...	2.00E-27
2616c	Seq. ID No. 5463	Seq. ID No. 5464	membrane	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	1.00E-10
2617b	Seq. ID No. 5477	Seq. ID No. 5478	transport	putative ABC transporter (ATP-binding protein), St...	9.00E-69
2623b	Seq. ID No. 5491	Seq. ID No. 5492	wall	Lactococcus lactis subsp. cremoris Bacteria; Firmi...	2.00E-23
2628	Seq. ID No. 5509	Seq. ID No. 5510	transport	Pseudogene, similar to glycine-betaine bindin, Lis...	2.00E-77
2629b	Seq. ID No. 5513	Seq. ID No. 5514	transport	oligopeptide ABC transporte, Bacillus halodurans B...	1.00E-149
2633d	Seq. ID No. 5525	Seq. ID No. 5526	transport	oligopeptide ABC transporte, Bacillus halodurans B...	1.00E-149
2637a	Seq. ID No. 5529	Seq. ID No. 5530	transport	oligopeptide ABC transporte, Bacillus halodurans B...	1.00E-140
2643b	Seq. ID No. 5537	Seq. ID No. 5538	peptidoglycan	Penicillin-binding protein 2a, Streptococcus pneum...	1.00E-143
2659b	Seq. ID No. 5567	Seq. ID No. 5568	hemolysin	putative hemolysin, Streptococcus pyogenes MGAS823...	5.00E-71
2674b	Seq. ID No. 5599	Seq. ID No. 5600	membrane	putative integral membrane protei... AL162756...	5.00E-21
2680c	Seq. ID No. 5621	Seq. ID No. 5622	virulence	Staphylococcus aureus mutant P11C12 virulence gene...	1.00E-160

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
2688c	Seq. ID No. 5637	Seq. ID No. 5638	transport	phosphotidylglycero phosphate synthase, Streptococc...	4.00E-43
2723	Seq. ID No. 5699	Seq. ID No. 5700	membrane	Uncharacterized membrane protein, homolog o, Clostr...	1.00E-13
2734c	Seq. ID No. 5723	Seq. ID No. 5724	transport	cation transporter, Lactococcus lactis subsp. lact...	9.00E-62
2738c	Seq. ID No. 5733	Seq. ID No. 5734	transport	transporter, Bacillus halodurans Bacteria; Firmicu...	3.00E-21
2748c	Seq. ID No. 5761	Seq. ID No. 5762	transport	conserved hypothetical protein, Thermotoga maritim...	5.00E-34
2758d	Seq. ID No. 5791	Seq. ID No. 5792	immunogenic	Propionibacterium acnes immunogenic ... Aau49434...	3.00E-36
2801b	Seq. ID No. 5895	Seq. ID No. 5896	response regulator	VanSB, Enterococcus faecalis Bacteria; Firmicutes;...	1.00E-21
2805b	Seq. ID No. 5901	Seq. ID No. 5902	transmembrane	transmembrane protein Vexp3, Streptococcus pneumon...	1.00E-130
2809	Seq. ID No. 5903	Seq. ID No. 5904	transport	ABC transporter, ATP-binding protein Vexp2, Strept...	1.00E-63
2810c	Seq. ID No. 5909	Seq. ID No. 5910	membrane	ABC transporter membrane-spanning permease - Pe, S...	1.00E-59
2812	Seq. ID No. 5913	Seq. ID No. 5914	transport	probable ABC transporter, Clostridium perfringens ...	1.00E-102
2816	Seq. ID No. 5919	Seq. ID No. 5920	transport	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	5.00E-59
2818e	Seq. ID No. 5929	Seq. ID No. 5930	transport	amino acid ABC transporter permease protein, Lacto...	2.00E-58



TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
2822a	Seq. ID No. 5939	Seq. ID No. 5940	membrane	putative membrane protein, Salmonella enterica sub...	7.00E-27
2856c	Seq. ID No. 6001	Seq. ID No. 6002	transport	heavy-metal transporting CPx-type ATPase, Methanot...	1.00E-131
2881	Seq. ID No. 6043	Seq. ID No. 6044	surface	surface protein (GW repeat) similar t, Listeria in...	4.00E-23
2883d	Seq. ID No. 6053	Seq. ID No. 6054	transport	ABC transporter permease protein, Lactococcus lact...	1.00E-107
2886b	Seq. ID No. 6057	Seq. ID No. 6058	transport	Listeria monocytogenes Bacteria; Firmicutes; Bacil...	5.00E-69
2900b	Seq. ID No. 6089	Seq. ID No. 6090	wall	YojL, Bacillus subtilis Bacteria; Firmicutes; Baci...	2.00E-15
2902	Seq. ID No. 6095	Seq. ID No. 6096	peptidoglycan	beta-1,4-N-acetylmuramoylhydr olase, Enterococcus h...	2.00E-32
2906	Seq. ID No. 6103	Seq. ID No. 6104	immunoglobulin	Streptococcus sp. G148 Bacteria; Firmicutes; Bacil...	2.00E-17
2909d	Seq. ID No. 6111	Seq. ID No. 6112	transmembrane	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	1.00E-144
2913b	Seq. ID No. 6117	Seq. ID No. 6118	response regulator	putative histidine kinase, Lactobacillus sakei Bac...	1.00E-92
2931c	Seq. ID No. 6165	Seq. ID No. 6166	transport	putative sodium/glucose cotransporter, Salmonella ...	8.00E-96
2933b	Seq. ID No. 6169	Seq. ID No. 6170	immunogenic	Propionibacterium acnes immunogenic protein #6411....	1.00E-19
2941b	Seq. ID No. 6185	Seq. ID No. 6186	transport	probable ABC transporter, Clostridium perfringens ...	1.00E-145

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
2943b	Seq. ID No. 6191	Seq. ID No. 6192	transport	ABC transporter ATP binding protein, Lactococcus l...	1.00E-114
2948d	Seq. ID No. 6209	Seq. ID No. 6210	membrane	Listeria innocua Bacteria; Firmicutes; Bacillus/Ci...	4.00E-56
2955e	Seq. ID No. 6229	Seq. ID No. 6230	membrane	putative integral membrane transporter protein, Si...	4.00E-35
2965c	Seq. ID No. 6257	Seq. ID No. 6258	hemolysin	hemolysin, Treponema denticola Bact... U30249...	1E-55
2969	Seq. ID No. 6263	Seq. ID No. 6264	Membrane	Membrane-fusion protein, Thermoanaerobacter tengco...	5.00E-23
2971b	Seq. ID No. 6271	Seq. ID No. 6272	lipoprotein	ABC-type transport systems, involved i, Thermoanae...	5.00E-72
2974b	Seq. ID No. 6275	Seq. ID No. 6276	lipoprotein	ABC-type transport systems, involved i, Thermoanae...	4.00E-61
2980a	Seq. ID No. 6289	Seq. ID No. 6290	transport	unknown, Pasteurella multocida Bacteria; Proteobac...	5.00E-13
2986b	Seq. ID No. 6303	Seq. ID No. 6304	transport	rnfD protein, Pseudomonas stutzeri A15 Bacteria; P...	3.00E-28
3016b	Seq. ID No. 6365	Seq. ID No. 6366	membrane	ABC transporter membrane-spanning permease - Na, S...	3.00E-27
3017	Seq. ID No. 6369	Seq. ID No. 6370	transporter	ABC transporter ATP binding protein, Lactococcus l...	6.00E-82
3024a	Seq. ID No. 6383	Seq. ID No. 6384	virulence	Amino acid sequence of a virulence factor encoded ...	2.00E-13

TABLE 8: BLASTP

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
	Seq. ID No.	Seq. ID No.		putative host cell surface-exposed	
3037a	6415	6416	lipoprotein	lipoprotein, St...	8.00E-13

Listed in Table 9 are 242 ORFs that share some homology with the ORFs predicted by proteomic methods used for studying surface exposed proteins of *Streptococcus pneumoniae*.

5

TABLE 9: PROTEOMICS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1	Seq. ID No. 1	Seq. ID No. 2
2b	Seq. ID No. 5	Seq. ID No. 6
56b	Seq. ID No. 93	Seq. ID No. 94
57a	Seq. ID No. 95	Seq. ID No. 96
60b	Seq. ID No. 103	Seq. ID No. 104
62a	Seq. ID No. 107	Seq. ID No. 108
85c	Seq. ID No. 157	Seq. ID No. 158
112b	Seq. ID No. 223	Seq. ID No. 224
114	Seq. ID No. 225	Seq. ID No. 226
121	Seq. ID No. 233	Seq. ID No. 234
124c	Seq. ID No. 239	Seq. ID No. 240
129c	Seq. ID No. 253	Seq. ID No. 254
157b	Seq. ID No. 317	Seq. ID No. 318
158b	Seq. ID No. 321	Seq. ID No. 322
165a	Seq. ID No. 341	Seq. ID No. 342
167	Seq. ID No. 345	Seq. ID No. 346
171b	Seq. ID No. 353	Seq. ID No. 354
175	Seq. ID No. 361	Seq. ID No. 362
176	Seq. ID No. 363	Seq. ID No. 364
177a	Seq. ID No. 365	Seq. ID No. 366

TABLE 9: PROTEOMICS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
180b	Seq. ID No. 375	Seq. ID No. 376
184	Seq. ID No. 379	Seq. ID No. 380
186	Seq. ID No. 383	Seq. ID No. 384
188	Seq. ID No. 389	Seq. ID No. 390
189b	Seq. ID No. 391	Seq. ID No. 392
192b	Seq. ID No. 397	Seq. ID No. 398
195	Seq. ID No. 405	Seq. ID No. 406
197a	Seq. ID No. 409	Seq. ID No. 410
198b	Seq. ID No. 415	Seq. ID No. 416
203	Seq. ID No. 423	Seq. ID No. 424
204	Seq. ID No. 425	Seq. ID No. 426
205	Seq. ID No. 427	Seq. ID No. 428
206	Seq. ID No. 429	Seq. ID No. 430
208b	Seq. ID No. 435	Seq. ID No. 436
210	Seq. ID No. 437	Seq. ID No. 438
211	Seq. ID No. 439	Seq. ID No. 440
213	Seq. ID No. 441	Seq. ID No. 442
215a	Seq. ID No. 443	Seq. ID No. 444
218	Seq. ID No. 445	Seq. ID No. 446
219	Seq. ID No. 447	Seq. ID No. 448
220a	Seq. ID No. 449	Seq. ID No. 450
226b	Seq. ID No. 461	Seq. ID No. 462
227	Seq. ID No. 463	Seq. ID No. 464
228a	Seq. ID No. 465	Seq. ID No. 466
249a	Seq. ID No. 513	Seq. ID No. 514
262	Seq. ID No. 543	Seq. ID No. 544
265	Seq. ID No. 551	Seq. ID No. 552
267b	Seq. ID No. 553	Seq. ID No. 554
269a	Seq. ID No. 559	Seq. ID No. 560

TABLE 9: PROTEOMICS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
284a	Seq. ID No. 595	Seq. ID No. 596
286a	Seq. ID No. 601	Seq. ID No. 602
311	Seq. ID No. 637	Seq. ID No. 638
315	Seq. ID No. 649	Seq. ID No. 650
318a	Seq. ID No. 657	Seq. ID No. 658
321	Seq. ID No. 669	Seq. ID No. 670
324	Seq. ID No. 675	Seq. ID No. 676
329	Seq. ID No. 683	Seq. ID No. 684
351	Seq. ID No. 753	Seq. ID No. 754
429b	Seq. ID No. 929	Seq. ID No. 930
450a	Seq. ID No. 969	Seq. ID No. 970
473	Seq. ID No. 1041	Seq. ID No. 1042
474	Seq. ID No. 1043	Seq. ID No. 1044
498a	Seq. ID No. 1085	Seq. ID No. 1086
499a	Seq. ID No. 1089	Seq. ID No. 1090
500	Seq. ID No. 1093	Seq. ID No. 1094
502c	Seq. ID No. 1097	Seq. ID No. 1098
504	Seq. ID No. 1099	Seq. ID No. 1100
505a	Seq. ID No. 1101	Seq. ID No. 1102
543a	Seq. ID No. 1175	Seq. ID No. 1176
551	Seq. ID No. 1205	Seq. ID No. 1206
570b	Seq. ID No. 1237	Seq. ID No. 1238
687	Seq. ID No. 1459	Seq. ID No. 1460
709	Seq. ID No. 1495	Seq. ID No. 1496
710	Seq. ID No. 1497	Seq. ID No. 1498
715a	Seq. ID No. 1503	Seq. ID No. 1504
722c	Seq. ID No. 1517	Seq. ID No. 1518
726	Seq. ID No. 1527	Seq. ID No. 1528
728b	Seq. ID No. 1531	Seq. ID No. 1532

TABLE 9: PROTEOMICS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
730d	Seq. ID No. 1539	Seq. ID No. 1540
732	Seq. ID No. 1543	Seq. ID No. 1544
738c	Seq. ID No. 1549	Seq. ID No. 1550
747	Seq. ID No. 1573	Seq. ID No. 1574
792	Seq. ID No. 1657	Seq. ID No. 1658
829a	Seq. ID No. 1709	Seq. ID No. 1710
859b	Seq. ID No. 1767	Seq. ID No. 1768
866b	Seq. ID No. 1785	Seq. ID No. 1786
886	Seq. ID No. 1821	Seq. ID No. 1822
938	Seq. ID No. 1889	Seq. ID No. 1890
954	Seq. ID No. 1925	Seq. ID No. 1926
977a	Seq. ID No. 1969	Seq. ID No. 1970
992	Seq. ID No. 2003	Seq. ID No. 2004
1016c	Seq. ID No. 2047	Seq. ID No. 2048
1033a	Seq. ID No. 2075	Seq. ID No. 2076
1036b	Seq. ID No. 2089	Seq. ID No. 2090
1037	Seq. ID No. 2093	Seq. ID No. 2094
1049a	Seq. ID No. 2117	Seq. ID No. 2118
1058	Seq. ID No. 2137	Seq. ID No. 2138
1062	Seq. ID No. 2143	Seq. ID No. 2144
1094a	Seq. ID No. 2205	Seq. ID No. 2206
1108b	Seq. ID No. 2235	Seq. ID No. 2236
1131	Seq. ID No. 2257	Seq. ID No. 2258
1149	Seq. ID No. 2301	Seq. ID No. 2302
1171c	Seq. ID No. 2363	Seq. ID No. 2364
1194	Seq. ID No. 2423	Seq. ID No. 2424
1205	Seq. ID No. 2445	Seq. ID No. 2446
1208	Seq. ID No. 2451	Seq. ID No. 2452
1221a	Seq. ID No. 2481	Seq. ID No. 2482

TABLE 9: PROTEOMICS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1226	Seq. ID No. 2495	Seq. ID No. 2496
1230	Seq. ID No. 2505	Seq. ID No. 2506
1256	Seq. ID No. 2577	Seq. ID No. 2578
1258c	Seq. ID No. 2587	Seq. ID No. 2588
1271	Seq. ID No. 2613	Seq. ID No. 2614
1281	Seq. ID No. 2633	Seq. ID No. 2634
1288	Seq. ID No. 2651	Seq. ID No. 2652
1297a	Seq. ID No. 2665	Seq. ID No. 2666
1300	Seq. ID No. 2669	Seq. ID No. 2670
1305c	Seq. ID No. 2677	Seq. ID No. 2678
1308e	Seq. ID No. 2687	Seq. ID No. 2688
1315	Seq. ID No. 2693	Seq. ID No. 2694
1318	Seq. ID No. 2699	Seq. ID No. 2700
1321	Seq. ID No. 2711	Seq. ID No. 2712
1322b	Seq. ID No. 2715	Seq. ID No. 2716
1349b	Seq. ID No. 2757	Seq. ID No. 2758
1368	Seq. ID No. 2791	Seq. ID No. 2792
1371	Seq. ID No. 2793	Seq. ID No. 2794
1377	Seq. ID No. 2803	Seq. ID No. 2804
1408	Seq. ID No. 2867	Seq. ID No. 2868
1431	Seq. ID No. 2919	Seq. ID No. 2920
1437a	Seq. ID No. 2929	Seq. ID No. 2930
1462b	Seq. ID No. 3005	Seq. ID No. 3006
1466d	Seq. ID No. 3019	Seq. ID No. 3020
1508	Seq. ID No. 3125	Seq. ID No. 3126
1512	Seq. ID No. 3137	Seq. ID No. 3138
1528	Seq. ID No. 3161	Seq. ID No. 3162
1537	Seq. ID No. 3179	Seq. ID No. 3180
1573	Seq. ID No. 3251	Seq. ID No. 3252

TABLE 9: PROTEOMICS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1578	Seq. ID No. 3259	Seq. ID No. 3260
1588	Seq. ID No. 3285	Seq. ID No. 3286
1600a	Seq. ID No. 3309	Seq. ID No. 3310
1606a	Seq. ID No. 3317	Seq. ID No. 3318
1619	Seq. ID No. 3337	Seq. ID No. 3338
1623b	Seq. ID No. 3345	Seq. ID No. 3346
1626b	Seq. ID No. 3359	Seq. ID No. 3360
1680	Seq. ID No. 3475	Seq. ID No. 3476
1694b	Seq. ID No. 3515	Seq. ID No. 3516
1696	Seq. ID No. 3521	Seq. ID No. 3522
1759	Seq. ID No. 3641	Seq. ID No. 3642
1788c	Seq. ID No. 3695	Seq. ID No. 3696
1816a	Seq. ID No. 3793	Seq. ID No. 3794
1861b	Seq. ID No. 3901	Seq. ID No. 3902
1875b	Seq. ID No. 3927	Seq. ID No. 3928
1912	Seq. ID No. 3987	Seq. ID No. 3988
1918c	Seq. ID No. 4001	Seq. ID No. 4002
1940	Seq. ID No. 4057	Seq. ID No. 4058
1951a	Seq. ID No. 4081	Seq. ID No. 4082
1960c	Seq. ID No. 4111	Seq. ID No. 4112
1967	Seq. ID No. 4125	Seq. ID No. 4126
1996	Seq. ID No. 4193	Seq. ID No. 4194
2000	Seq. ID No. 4195	Seq. ID No. 4196
2020	Seq. ID No. 4237	Seq. ID No. 4238
2024b	Seq. ID No. 4247	Seq. ID No. 4248
2094	Seq. ID No. 4383	Seq. ID No. 4384
2097	Seq. ID No. 4393	Seq. ID No. 4394
2100	Seq. ID No. 4397	Seq. ID No. 4398
2104	Seq. ID No. 4401	Seq. ID No. 4402



TABLE 9: PROTEOMICS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2117	Seq. ID No. 4435	Seq. ID No. 4436
2125a	Seq. ID No. 4449	Seq. ID No. 4450
2140b	Seq. ID No. 4471	Seq. ID No. 4472
2149b	Seq. ID No. 4491	Seq. ID No. 4492
2156c	Seq. ID No. 4511	Seq. ID No. 4512
2160b	Seq. ID No. 4519	Seq. ID No. 4520
2164	Seq. ID No. 4531	Seq. ID No. 4532
2174	Seq. ID No. 4549	Seq. ID No. 4550
2185	Seq. ID No. 4577	Seq. ID No. 4578
2186b	Seq. ID No. 4581	Seq. ID No. 4582
2189b	Seq. ID No. 4585	Seq. ID No. 4586
2203	Seq. ID No. 4609	Seq. ID No. 4610
2204	Seq. ID No. 4611	Seq. ID No. 4612
2206a	Seq. ID No. 4613	Seq. ID No. 4614
2234a	Seq. ID No. 4675	Seq. ID No. 4676
2238	Seq. ID No. 4685	Seq. ID No. 4686
2256	Seq. ID No. 4719	Seq. ID No. 4720
2260c	Seq. ID No. 4729	Seq. ID No. 4730
2269	Seq. ID No. 4743	Seq. ID No. 4744
2275b	Seq. ID No. 4755	Seq. ID No. 4756
2284	Seq. ID No. 4781	Seq. ID No. 4782
2286b	Seq. ID No. 4787	Seq. ID No. 4788
2311	Seq. ID No. 4837	Seq. ID No. 4838
2312b	Seq. ID No. 4841	Seq. ID No. 4842
2316	Seq. ID No. 4849	Seq. ID No. 4850
2321a	Seq. ID No. 4855	Seq. ID No. 4856
2338a	Seq. ID No. 4889	Seq. ID No. 4890
2344	Seq. ID No. 4901	Seq. ID No. 4902
2353	Seq. ID No. 4915	Seq. ID No. 4916

**TABLE 9: PROTEOMICS**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2354	Seq. ID No. 4917	Seq. ID No. 4918
2363b	Seq. ID No. 4931	Seq. ID No. 4932
2365b	Seq. ID No. 4935	Seq. ID No. 4936
2384a	Seq. ID No. 4977	Seq. ID No. 4978
2409a	Seq. ID No. 5025	Seq. ID No. 5026
2410	Seq. ID No. 5029	Seq. ID No. 5030
2449b	Seq. ID No. 5109	Seq. ID No. 5110
2453	Seq. ID No. 5115	Seq. ID No. 5116
2455	Seq. ID No. 5117	Seq. ID No. 5118
2465a	Seq. ID No. 5155	Seq. ID No. 5156
2477	Seq. ID No. 5185	Seq. ID No. 5186
2485	Seq. ID No. 5201	Seq. ID No. 5202
2489	Seq. ID No. 5203	Seq. ID No. 5204
2497b	Seq. ID No. 5219	Seq. ID No. 5220
2516b	Seq. ID No. 5261	Seq. ID No. 5262
2527a	Seq. ID No. 5289	Seq. ID No. 5290
2528b	Seq. ID No. 5295	Seq. ID No. 5296
2564b	Seq. ID No. 5377	Seq. ID No. 5378
2568	Seq. ID No. 5389	Seq. ID No. 5390
2578	Seq. ID No. 5399	Seq. ID No. 5400
2585	Seq. ID No. 5411	Seq. ID No. 5412
2643b	Seq. ID No. 5537	Seq. ID No. 5538
2680c	Seq. ID No. 5621	Seq. ID No. 5622
2684a	Seq. ID No. 5627	Seq. ID No. 5628
2695	Seq. ID No. 5657	Seq. ID No. 5658
2716a	Seq. ID No. 5675	Seq. ID No. 5676
2732	Seq. ID No. 5717	Seq. ID No. 5718
2752	Seq. ID No. 5777	Seq. ID No. 5778
2785b	Seq. ID No. 5859	Seq. ID No. 5860

**TABLE 9: PROTEOMICS**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2805b	Seq. ID No. 5901	Seq. ID No. 5902
2812	Seq. ID No. 5913	Seq. ID No. 5914
2816	Seq. ID No. 5919	Seq. ID No. 5920
2818c	Seq. ID No. 5925	Seq. ID No. 5926
2820	Seq. ID No. 5933	Seq. ID No. 5934
2886a	Seq. ID No. 6055	Seq. ID No. 6056
2918	Seq. ID No. 6129	Seq. ID No. 6130
2921	Seq. ID No. 6133	Seq. ID No. 6134
2941c	Seq. ID No. 6187	Seq. ID No. 6188
2943c	Seq. ID No. 6193	Seq. ID No. 6194
2954	Seq. ID No. 6219	Seq. ID No. 6220
2971b	Seq. ID No. 6271	Seq. ID No. 6272
2975	Seq. ID No. 6277	Seq. ID No. 6278
3017	Seq. ID No. 6369	Seq. ID No. 6370
3020	Seq. ID No. 6375	Seq. ID No. 6376
3022	Seq. ID No. 6379	Seq. ID No. 6380
3026b	Seq. ID No. 6389	Seq. ID No. 6390
3118b	Seq. ID No. 6591	Seq. ID No. 6592
3121	Seq. ID No. 6605	Seq. ID No. 6606

Listed in Table 10 are 22 ORFs predicted to be covalently bound to the peptidoglycan region via the 'LPXTG' motif. These ORFs were found using the HMM LPXTG motif finder and are classified as proteins that might be targeted by sortase. The Applicants developed a HMM using approximately 70 known prokaryotic polypeptides containing the LPXTG cell wall sorting signal. This HMM was used to predict cell wall polypeptides that are anchored to the peptidoglycan layer.

5

**TABLE 10: LPXTG MOTIF**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
246a	Seq. ID No. 503	Seq. ID No. 504
246b	Seq. ID No. 505	Seq. ID No. 506
609a	Seq. ID No. 1315	Seq. ID No. 1316
609b	Seq. ID No. 1317	Seq. ID No. 1318
631a	Seq. ID No. 1363	Seq. ID No. 1364
631b	Seq. ID No. 1365	Seq. ID No. 1366
631c	Seq. ID No. 1367	Seq. ID No. 1368
631d	Seq. ID No. 1369	Seq. ID No. 1370
743a	Seq. ID No. 1559	Seq. ID No. 1560
743b	Seq. ID No. 1561	Seq. ID No. 1562
751	Seq. ID No. 1581	Seq. ID No. 1582
847a	Seq. ID No. 1739	Seq. ID No. 1740
847b	Seq. ID No. 1741	Seq. ID No. 1742
1381a	Seq. ID No. 2811	Seq. ID No. 2812
1381b	Seq. ID No. 2813	Seq. ID No. 2814
1747	Seq. ID No. 3619	Seq. ID No. 3620
2669a	Seq. ID No. 5587	Seq. ID No. 5588
2669b	Seq. ID No. 5589	Seq. ID No. 5590
2669c	Seq. ID No. 5591	Seq. ID No. 5592
2757a	Seq. ID No. 5781	Seq. ID No. 5782
2757b	Seq. ID No. 5783	Seq. ID No. 5784
2906	Seq. ID No. 6103	Seq. ID No. 6104

Listed in Table 11 are 71 ORFs predicted to be lipoproteins based on the HMM Lipo program.

**TABLE 11: LIPOPROTEIN**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
38a	Seq. ID No. 45	Seq. ID No. 46
38b	Seq. ID No. 47	Seq. ID No. 48
91a	Seq. ID No. 171	Seq. ID No. 172
114	Seq. ID No. 225	Seq. ID No. 226
201a	Seq. ID No. 419	Seq. ID No. 420
249a	Seq. ID No. 513	Seq. ID No. 514
277c	Seq. ID No. 575	Seq. ID No. 576
283a	Seq. ID No. 591	Seq. ID No. 592
283b	Seq. ID No. 593	Seq. ID No. 594
318a	Seq. ID No. 657	Seq. ID No. 658
318b	Seq. ID No. 659	Seq. ID No. 660
321	Seq. ID No. 669	Seq. ID No. 670
324	Seq. ID No. 675	Seq. ID No. 676
349b	Seq. ID No. 745	Seq. ID No. 746
349c	Seq. ID No. 747	Seq. ID No. 748
431	Seq. ID No. 935	Seq. ID No. 936
476	Seq. ID No. 1045	Seq. ID No. 1046
492	Seq. ID No. 1075	Seq. ID No. 1076
524b	Seq. ID No. 1137	Seq. ID No. 1138
542	Seq. ID No. 1173	Seq. ID No. 1174
546b	Seq. ID No. 1191	Seq. ID No. 1192
546c	Seq. ID No. 1193	Seq. ID No. 1194
547a	Seq. ID No. 1195	Seq. ID No. 1196
744	Seq. ID No. 1563	Seq. ID No. 1564
794b	Seq. ID No. 1661	Seq. ID No. 1662
794c	Seq. ID No. 1663	Seq. ID No. 1664
794d	Seq. ID No. 1665	Seq. ID No. 1666

**TABLE 11: LIPOPROTEIN**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
870	Seq. ID No. 1791	Seq. ID No. 1792
873c	Seq. ID No. 1797	Seq. ID No. 1798
951a	Seq. ID No. 1917	Seq. ID No. 1918
977a	Seq. ID No. 1969	Seq. ID No. 1970
1047b	Seq. ID No. 2115	Seq. ID No. 2116
1067	Seq. ID No. 2159	Seq. ID No. 2160
1197	Seq. ID No. 2429	Seq. ID No. 2430
1239	Seq. ID No. 2527	Seq. ID No. 2528
1318	Seq. ID No. 2699	Seq. ID No. 2700
1382	Seq. ID No. 2815	Seq. ID No. 2816
1411b	Seq. ID No. 2875	Seq. ID No. 2876
1449a	Seq. ID No. 2975	Seq. ID No. 2976
1449b	Seq. ID No. 2977	Seq. ID No. 2978
1455b	Seq. ID No. 2991	Seq. ID No. 2992
1475	Seq. ID No. 3043	Seq. ID No. 3044
1607b	Seq. ID No. 3323	Seq. ID No. 3324
1619	Seq. ID No. 3337	Seq. ID No. 3338
1970b	Seq. ID No. 4133	Seq. ID No. 4134
1973	Seq. ID No. 4137	Seq. ID No. 4138
2146	Seq. ID No. 4481	Seq. ID No. 4482
2249	Seq. ID No. 4705	Seq. ID No. 4706
2308	Seq. ID No. 4827	Seq. ID No. 4828
2329a	Seq. ID No. 4869	Seq. ID No. 4870
2453	Seq. ID No. 5115	Seq. ID No. 5116
2564b	Seq. ID No. 5377	Seq. ID No. 5378
2564c	Seq. ID No. 5379	Seq. ID No. 5380
2623b	Seq. ID No. 5491	Seq. ID No. 5492
2628	Seq. ID No. 5509	Seq. ID No. 5510
2629b	Seq. ID No. 5513	Seq. ID No. 5514

**TABLE 11: LIPOPROTEIN**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2633d	Seq. ID No. 5525	Seq. ID No. 5526
2637a	Seq. ID No. 5529	Seq. ID No. 5530
2637b	Seq. ID No. 5531	Seq. ID No. 5532
2799a	Seq. ID No. 5889	Seq. ID No. 5890
2810c	Seq. ID No. 5909	Seq. ID No. 5910
2869b	Seq. ID No. 6025	Seq. ID No. 6026
2869c	Seq. ID No. 6027	Seq. ID No. 6028
2900a	Seq. ID No. 6087	Seq. ID No. 6088
2900b	Seq. ID No. 6089	Seq. ID No. 6090
2993a	Seq. ID No. 6325	Seq. ID No. 6326
2993b	Seq. ID No. 6327	Seq. ID No. 6328
3037a	Seq. ID No. 6415	Seq. ID No. 6416
3145b	Seq. ID No. 6637	Seq. ID No. 6638
3145c	Seq. ID No. 6639	Seq. ID No. 6640
3147c	Seq. ID No. 6645	Seq. ID No. 6646

Listed in Table 12 are ORFs encoding polypeptides predicted to be noncovalently bound to the peptidoglycan layer based on the HMM program. Four ORFs were identified that were predicted to encode proteins that bound peptidoglycans noncovalently.

**TABLE 12: PEPTIDOGLYCAN BINDING**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1733	Seq. ID No. 3589	Seq. ID No. 3590
1912	Seq. ID No. 3987	Seq. ID No. 3988
2497b	Seq. ID No. 5219	Seq. ID No. 5220
2549	Seq. ID No. 5337	Seq. ID No. 5338

Also contemplated in the present invention are other important characteristics of *Alloiococcus otitidis* ORFs. For example, the *Alloiococcus otitidis* ORFs were searched

to identify any that encode polypeptides with RGD motifs. Proteins that contain the Arg-Gly-Asp (RGD) attachment motif, together with integrins that serve as their receptor, constitute a major recognition system for cell adhesion, and thus are putative *Alloiococcus otitidis* polypeptide antigens. RGD recognition is one mechanism used by microbes to gain entry into eukaryotic tissues (Stockbauer *et al.*, 1999; Isberg and Nhieu, 1994). However, not all RGD-containing proteins mediate cell attachment. It has been shown that RGD-containing peptides with a proline at the carboxy end (RGDP) are inactive in cell attachment assays (Pierschbacher and Rouslahti, 1987) and were excluded from consideration.

Listed in Table 13 are 125 ORFs found to contain the peptide sequence 'RGDX' where X is not proline. These ORFs are predicted to be surface localized and may interact with eukaryotic extracellular proteins.

TABLE 13: RGD MOTIF

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
24	Seq. ID No. 37	Seq. ID No. 38
58	Seq. ID No. 99	Seq. ID No. 100
62a	Seq. ID No. 107	Seq. ID No. 108
62b	Seq. ID No. 109	Seq. ID No. 110
62c	Seq. ID No. 111	Seq. ID No. 112
171a	Seq. ID No. 351	Seq. ID No. 352
171b	Seq. ID No. 353	Seq. ID No. 354
228a	Seq. ID No. 465	Seq. ID No. 466
228b	Seq. ID No. 467	Seq. ID No. 468
228c	Seq. ID No. 469	Seq. ID No. 470
228d	Seq. ID No. 471	Seq. ID No. 472
329	Seq. ID No. 683	Seq. ID No. 684
383a	Seq. ID No. 821	Seq. ID No. 822
383b	Seq. ID No. 823	Seq. ID No. 824
467a	Seq. ID No. 1021	Seq. ID No. 1022
467b	Seq. ID No. 1023	Seq. ID No. 1024
535	Seq. ID No. 1157	Seq. ID No. 1158
536	Seq. ID No. 1159	Seq. ID No. 1160



**TABLE 13: RGD MOTIF**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
569	Seq. ID No. 1233	Seq. ID No. 1234
614a	Seq. ID No. 1333	Seq. ID No. 1334
614b	Seq. ID No. 1335	Seq. ID No. 1336
680	Seq. ID No. 1449	Seq. ID No. 1450
743a	Seq. ID No. 1559	Seq. ID No. 1560
743b	Seq. ID No. 1561	Seq. ID No. 1562
744	Seq. ID No. 1563	Seq. ID No. 1564
774	Seq. ID No. 1625	Seq. ID No. 1626
863	Seq. ID No. 1777	Seq. ID No. 1778
890a	Seq. ID No. 1827	Seq. ID No. 1828
890b	Seq. ID No. 1829	Seq. ID No. 1830
929b	Seq. ID No. 1871	Seq. ID No. 1872
954	Seq. ID No. 1925	Seq. ID No. 1926
1057	Seq. ID No. 2135	Seq. ID No. 2136
1063	Seq. ID No. 2145	Seq. ID No. 2146
1077b	Seq. ID No. 2173	Seq. ID No. 2174
1077c	Seq. ID No. 2175	Seq. ID No. 2176
1077d	Seq. ID No. 2177	Seq. ID No. 2178
1077e	Seq. ID No. 2179	Seq. ID No. 2180
1132	Seq. ID No. 2259	Seq. ID No. 2260
1155a	Seq. ID No. 2317	Seq. ID No. 2318
1155b	Seq. ID No. 2319	Seq. ID No. 2320
1155c	Seq. ID No. 2321	Seq. ID No. 2322
1155d	Seq. ID No. 2323	Seq. ID No. 2324
1155e	Seq. ID No. 2325	Seq. ID No. 2326
1155f	Seq. ID No. 2327	Seq. ID No. 2328
1155g	Seq. ID No. 2329	Seq. ID No. 2330
1184	Seq. ID No. 2401	Seq. ID No. 2402
1302	Seq. ID No. 2671	Seq. ID No. 2672
1405	Seq. ID No. 2863	Seq. ID No. 2864

**TABLE 13: RGD MOTIF**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1409	Seq. ID No. 2869	Seq. ID No. 2870
1431	Seq. ID No. 2919	Seq. ID No. 2920
1432	Seq. ID No. 2921	Seq. ID No. 2922
1456	Seq. ID No. 2993	Seq. ID No. 2994
1489	Seq. ID No. 3087	Seq. ID No. 3088
1512	Seq. ID No. 3137	Seq. ID No. 3138
1587a	Seq. ID No. 3279	Seq. ID No. 3280
1587b	Seq. ID No. 3281	Seq. ID No. 3282
1587c	Seq. ID No. 3283	Seq. ID No. 3284
1616a	Seq. ID No. 3333	Seq. ID No. 3334
1616b	Seq. ID No. 3335	Seq. ID No. 3336
1689a	Seq. ID No. 3497	Seq. ID No. 3498
1689b	Seq. ID No. 3499	Seq. ID No. 3500
1689c	Seq. ID No. 3501	Seq. ID No. 3502
1700b	Seq. ID No. 3533	Seq. ID No. 3534
1775a	Seq. ID No. 3671	Seq. ID No. 3672
1775b	Seq. ID No. 3673	Seq. ID No. 3674
1775c	Seq. ID No. 3675	Seq. ID No. 3676
1838a	Seq. ID No. 3837	Seq. ID No. 3838
1838b	Seq. ID No. 3839	Seq. ID No. 3840
1838c	Seq. ID No. 3841	Seq. ID No. 3842
1838d	Seq. ID No. 3843	Seq. ID No. 3844
1875c	Seq. ID No. 3929	Seq. ID No. 3930
1895	Seq. ID No. 3961	Seq. ID No. 3962
1934	Seq. ID No. 4037	Seq. ID No. 4038
1996	Seq. ID No. 4193	Seq. ID No. 4194
2021	Seq. ID No. 4239	Seq. ID No. 4240
2065a	Seq. ID No. 4327	Seq. ID No. 4328
2065b	Seq. ID No. 4329	Seq. ID No. 4330
2068	Seq. ID No. 4333	Seq. ID No. 4334

**TABLE 13: RGD MOTIF**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2097	Seq. ID No. 4393	Seq. ID No. 4394
2138a	Seq. ID No. 4463	Seq. ID No. 4464
2138b	Seq. ID No. 4465	Seq. ID No. 4466
2138c	Seq. ID No. 4467	Seq. ID No. 4468
2196	Seq. ID No. 4597	Seq. ID No. 4598
2215a	Seq. ID No. 4629	Seq. ID No. 4630
2215b	Seq. ID No. 4631	Seq. ID No. 4632
2234a	Seq. ID No. 4675	Seq. ID No. 4676
2234b	Seq. ID No. 4677	Seq. ID No. 4678
2234c	Seq. ID No. 4679	Seq. ID No. 4680
2240a	Seq. ID No. 4689	Seq. ID No. 4690
2240b	Seq. ID No. 4691	Seq. ID No. 4692
2240c	Seq. ID No. 4693	Seq. ID No. 4694
2284	Seq. ID No. 4781	Seq. ID No. 4782
2292a	Seq. ID No. 4799	Seq. ID No. 4800
2292b	Seq. ID No. 4801	Seq. ID No. 4802
2292c	Seq. ID No. 4803	Seq. ID No. 4804
2322	Seq. ID No. 4861	Seq. ID No. 4862
2401	Seq. ID No. 5009	Seq. ID No. 5010
2461a	Seq. ID No. 5143	Seq. ID No. 5144
2461b	Seq. ID No. 5145	Seq. ID No. 5146
2475a	Seq. ID No. 5179	Seq. ID No. 5180
2475b	Seq. ID No. 5181	Seq. ID No. 5182
2475c	Seq. ID No. 5183	Seq. ID No. 5184
2513a	Seq. ID No. 5249	Seq. ID No. 5250
2513b	Seq. ID No. 5251	Seq. ID No. 5252
2513c	Seq. ID No. 5253	Seq. ID No. 5254
2516a	Seq. ID No. 5259	Seq. ID No. 5260
2516b	Seq. ID No. 5261	Seq. ID No. 5262
2528a	Seq. ID No. 5293	Seq. ID No. 5294

TABLE 13: RGD MOTIF

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2528b	Seq. ID No. 5295	Seq. ID No. 5296
2528c	Seq. ID No. 5297	Seq. ID No. 5298
2528d	Seq. ID No. 5299	Seq. ID No. 5300
2535a	Seq. ID No. 5307	Seq. ID No. 5308
2535b	Seq. ID No. 5309	Seq. ID No. 5310
2585	Seq. ID No. 5411	Seq. ID No. 5412
2643a	Seq. ID No. 5535	Seq. ID No. 5536
2643b	Seq. ID No. 5537	Seq. ID No. 5538
2744	Seq. ID No. 5745	Seq. ID No. 5746
2768a	Seq. ID No. 5821	Seq. ID No. 5822
2768b	Seq. ID No. 5823	Seq. ID No. 5824
2768c	Seq. ID No. 5825	Seq. ID No. 5826
2871	Seq. ID No. 6029	Seq. ID No. 6030
2934	Seq. ID No. 6171	Seq. ID No. 6172
2988a	Seq. ID No. 6307	Seq. ID No. 6308
2988b	Seq. ID No. 6309	Seq. ID No. 6310
2988c	Seq. ID No. 6311	Seq. ID No. 6312

Listed in Table 14 are the 39 ORFs whose BlastP results predict for possible capsule biosynthesis and transport. Keywords used in the search are: polysaccharide, saccharide, rhamnos, dexB, aliA, cap[A-Z], cps[A-Z], wze[A-Z], wzh[A-Z], teichu, tuaG, manB, pyrophosphorylase, glucose, eps[ABE], glucosyl, xylos, encapsula, pgs[ABC], exopolysacch, galactos, epimerase, lytR, lytABC, lysR, Transferase, GalNAc, GlcNAc, Spore, LPS, Peptidoglycan, Glutamate, Mannos, Oligosaccharide, Outer core, Arabinose, Teichoic, Teicho, Lipoteichoic, Glycerol, spo[A-Z], capsule, capsular.

TABLE 14: CAPSULE RELATED PROTEINS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
39a	Seq. ID No. 49	Seq. ID No. 50	capC	capsule biosynthesis protein CapC, (pXO2-57), Baci...	6.00E-19
39b	Seq. ID No. 51	Seq. ID No. 52	capC	capsule biosynthesis protein CapC, (pXO2-57), Baci...	7.00E-19
40	Seq. ID No. 53	Seq. ID No. 54	capB	CapB, Bacillus subtilis Bacteria; Firmicutes; Baci...	9.00E-95
41c	Seq. ID No. 59	Seq. ID No. 60	capA	PgsA, Bacillus subtilis Bacteria; Firmicutes; Baci...	9.00E-95
102	Seq. ID No. 195	Seq. ID No. 196	saccharide	Bacillus cereus Bacteria; Firmicutes; Bacillus/Clo...	1.00E-168
330c	Seq. ID No. 689	Seq. ID No. 690	transferase	Glycosyltransferase, Clostridium acetobutylicum Ba...	5.00E-79
337	Seq. ID No. 703	Seq. ID No. 704	transferase	glycosyltransferase, Lactococcus lactis subsp. lac...	2.00E-58
427c	Seq. ID No. 925	Seq. ID No. 926	capsular	unknown, Staphylococcus aureus Bacteria; Firmicute...	2.00E-46
760	Seq. ID No. 1597	Seq. ID No. 1598	dexB	maturase-related protein, Streptococcus pneumoniae...	6.00E-78
762b	Seq. ID No. 1601	Seq. ID No. 1602	cpsL	transposase, Streptococcus pneumoniae Bacteria; Fi...	1.00E-46
763b	Seq. ID No. 1607	Seq. ID No. 1608	capsular	transposase, Staphylococcus aureus Bacteria; Firmi...	5.00E-44
766	Seq. ID No. 1611	Seq. ID No. 1612	cpsL	transposase, Streptococcus pneumoniae Bacteria; Fi...	6.00E-44
767	Seq. ID No. 1613	Seq. ID No. 1614	capsular	transposase, Staphylococcus aureus Bacteria; Firmi...	4.00E-16
830	Seq. ID No. 1713	Seq. ID No. 1714	cpsA	Thermostable carboxypeptidase (cpsA-2), Sulfolobus...	4.00E-14

TABLE 14: CAPSULE RELATED PROTEINS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
1004a	Seq. ID No. 2029	Seq. ID No. 2030	EpsE	unknown, Lactobacillus rhamnosus Bacteria; Firmicu...	1.00E-168
1135b	Seq. ID No. 2263	Seq. ID No. 2264	capA	Bacillus anthracis Bacteria; Firmicutes; Bacillus/...	3.00E-25
1138	Seq. ID No. 2269	Seq. ID No. 2270	saccharide	unknown, Staphylococcus aureus Bacteria; Firmicute...	9.00E-60
1177	Seq. ID No. 2373	Seq. ID No. 2374	capsular	capsular polysaccharide biosynthesi... U67548...	9.00E-60
1200	Seq. ID No. 2437	Seq. ID No. 2438	xylos	acetylxylosidase, Caldicellulosiruptor saccharolyt...	9.00E-36
1288	Seq. ID No. 2651	Seq. ID No. 2652	lytR	membrane bound protein, Bacillus subtilis Bacteria...	3.00E-42
1355	Seq. ID No. 2767	Seq. ID No. 2768	manB	probable phosphomannomutase, Clostridium perfringe...	1.00E-136
1426b	Seq. ID No. 2907	Seq. ID No. 2908	polysacch aride	Orfde2, Enterococcus faecalis Bacteria; Firmicutes...	1.00E-103
1646e	Seq. ID No. 3397	Seq. ID No. 3398	polysacch aride	putative polysaccharide biosynthesis protein, Stre...	3.00E-24
1646f	Seq. ID No. 3399	Seq. ID No. 3400	polysacch aride	putative polysaccharide biosynthesis protein, Stre...	3.00E-78
1682b	Seq. ID No. 3479	Seq. ID No. 3480	polysacch aride	methionine aminopeptidase A, Enterococcus faecalis...	2.00E-68
1685	Seq. ID No. 3487	Seq. ID No. 3488	glucose	UDP-glucose 4-epimerase, Streptococcus pneumoniae ...	1.00E-111
1688a	Seq. ID No. 3491	Seq. ID No. 3492	polysacch aride	Orfde3, Enterococcus faecalis Bacteria; Firmicutes...	3.00E-78
1688b	Seq. ID No. 3493	Seq. ID No. 3494	polysacch aride	Orfde3, Enterococcus faecalis Bacteria; Firmicutes...	9.00E-34

TABLE 14: CAPSULE RELATED PROTEINS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Keyword	Description	Blast 'e' Value
1688c	Seq. ID No. 3495	Seq. ID No. 3496	transferase	RgpG, Lactobacillus delbrueckii Bacteria; Firmicut...	4.00E-99
1689a	Seq. ID No. 3497	Seq. ID No. 3498	tuaG	teichuronic acid biosynthesis, Bacillus halodurans...	9.00E-53
1694d	Seq. ID No. 3519	Seq. ID No. 3520	lytR	attenuator for lytABC and lytR expression, Bacillu...	6.00E-69
1696	Seq. ID No. 3521	Seq. ID No. 3522	glucose	putative UDP-glucose dehydrogenase, Escherichia co...	1.00E-157
1699b	Seq. ID No. 3529	Seq. ID No. 3530	teichu	unknown, Bacillus subtilis Bacteria; Firmicutes; G...	8.00E-30
1701a	Seq. ID No. 3535	Seq. ID No. 3536	mannos	alpha-D-mannose-alpha(1-6)phospha... AP001516...	1.00E-84
1710b	Seq. ID No. 3561	Seq. ID No. 3562	LPS	LPS biosynthesis protein RfaE, Ps... AE004912...	4.00E-12
1855	Seq. ID No. 3883	Seq. ID No. 3884	capsule	Regulatory function on capsule ex... AE008458...	5.00E-38
1857c	Seq. ID No. 3891	Seq. ID No. 3892	polysaccharide	Staphylococcus aureus subsp. aureus N315 Bacteria;...	1.00E-13
1902a	Seq. ID No. 3981	Seq. ID No. 3982	capsular	DNA topoisomerase IV subunit B, Streptococcus agal...	7.00E-15
1951d	Seq. ID No. 4087	Seq. ID No. 4088	saccharide	Phospholipid-lipopolysaccharide A... AE010571...	7.00E-84

Three potential capsule loci have been identified based on BlastP analysis listed in Table 14: poly-gamma-glutamate from base 20186 to 24645, sugar transport from base 159934 to 172757, and teichuronic from base 886658 to 930066. Table 15 lists the

5 ORFs found within these regions.

TABLE 15: CAPSULE LOCI

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Locus
38a	Seq. ID No. 45	Seq. ID No.46	Poly-gamma-glutamate
38b	Seq. ID No. 47	Seq. ID No. 48	Poly-gamma-glutamate
39b	Seq. ID No. 51	Seq. ID No. 52	Poly-gamma-glutamate
40	Seq. ID No. 53	Seq. ID No. 54	Poly-gamma-glutamate
41a	Seq. ID No.55	Seq. ID No.56	Poly-gamma-glutamate
41b	Seq. ID No.57	Seq. ID No.58	Poly-gamma-glutamate
41c	Seq. ID No. 59	Seq. ID No. 60	Poly-gamma-glutamate
329	Seq. ID No. 683	Seq. ID No. 684	sugar transport
330a	Seq. ID No.685	Seq. ID No.686	sugar transport
330b	Seq. ID No.687	Seq. ID No.688	sugar transport
330c	Seq. ID No. 689	Seq. ID No. 690	sugar transport
331	Seq. ID No.691	Seq. ID No.670	sugar transport
332	Seq. ID No.693	Seq. ID No.694	sugar transport
333	Seq. ID No.695	Seq. ID No.696	sugar transport
334	Seq. ID No.687	Seq. ID No.698	sugar transport
335a	Seq. ID No.699	Seq. ID No.670	sugar transport
335b	Seq. ID No. 701	Seq. ID No. 702	sugar transport
337	Seq. ID No. 703	Seq. ID No. 704	sugar transport
338a	Seq. ID No.705	Seq. ID No.706	sugar transport
338b	Seq. ID No.707	Seq. ID No.708	sugar transport
338c	Seq. ID No. 709	Seq. ID No. 710	sugar transport
341a	Seq. ID No.711	Seq. ID No.712	sugar transport
341b	Seq. ID No. 713	Seq. ID No. 714	sugar transport
342a	Seq. ID No.715	Seq. ID No.716	sugar transport
342b	Seq. ID No.717	Seq. ID No.718	sugar transport
342c	Seq. ID No.719	Seq. ID No.720	sugar transport
342d	Seq. ID No.721	Seq. ID No.722	sugar transport
342e	Seq. ID No.723	Seq. ID No.724	sugar transport
342f	Seq. ID No.725	Seq. ID No.726	sugar transport



TABLE 15: CAPSULE LOCI

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Locus
342g	Seq. ID No.727	Seq. ID No.728	sugar transport
342h	Seq. ID No. 729	Seq. ID No. 730	sugar transport
344a	Seq. ID No.731	Seq. ID No.732	sugar transport
344b	Seq. ID No. 733	Seq. ID No. 734	sugar transport
345	Seq. ID No. 735	Seq. ID No. 736	sugar transport
346a	Seq. ID No. 737	Seq. ID No. 738	sugar transport
346b	Seq. ID No.739	Seq. ID No.740	sugar transport
347	Seq. ID No. 741	Seq. ID No. 742	sugar transport
349a	Seq. ID No.743	Seq. ID No.744	sugar transport
349b	Seq. ID No.745	Seq. ID No.746	sugar transport
349c	Seq. ID No. 747	Seq. ID No. 748	sugar transport
350a	Seq. ID No.749	Seq. ID No.750	sugar transport
350b	Seq. ID No. 751	Seq. ID No. 752	sugar transport
351	Seq. ID No. 753	Seq. ID No. 754	sugar transport
1646a	Seq. ID No.3389	Seq. ID No.3390	Teichuronic
1646b	Seq. ID No.3391	Seq. ID No.3392	Teichuronic
1646c	Seq. ID No.3393	Seq. ID No.3394	Teichuronic
1646d	Seq. ID No.3395	Seq. ID No.3396	Teichuronic
1646e	Seq. ID No.3397	Seq. ID No.3398	Teichuronic
1646f	Seq. ID No. 3399	Seq. ID No. 3400	Teichuronic
1647	Seq. ID No. 3401	Seq. ID No. 3402	Teichuronic
1648b	Seq. ID No. 3403	Seq. ID No. 3404	Teichuronic
1649a	Seq. ID No.3405	Seq. ID No.3406	Teichuronic
1649b	Seq. ID No.3407	Seq. ID No.3408	Teichuronic
1649c	Seq. ID No. 3409	Seq. ID No. 3410	Teichuronic
1652a	Seq. ID No.3411	Seq. ID No.3412	Teichuronic
1652b	Seq. ID No. 3413	Seq. ID No. 3414	Teichuronic
1654	Seq. ID No. 3415	Seq. ID No. 3416	Teichuronic
1656b	Seq. ID No. 3417	Seq. ID No. 3418	Teichuronic

TABLE 15: CAPSULE LOCI

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Locus
1657	Seq. ID No.3419	Seq. ID No.3420	Teichuronic
1659a	Seq. ID No.3421	Seq. ID No.3422	Teichuronic
1659b	Seq. ID No.3423	Seq. ID No.3424	Teichuronic
1659c	Seq. ID No. 3425	Seq. ID No. 3426	Teichuronic
1660b	Seq. ID No. 3427	Seq. ID No. 3428	Teichuronic
1662a	Seq. ID No.3429	Seq. ID No.3430	Teichuronic
1662b	Seq. ID No. 3431	Seq. ID No. 3432	Teichuronic
1663	Seq. ID No.3433	Seq. ID No.3434	Teichuronic
1664	Seq. ID No. 3435	Seq. ID No. 3436	Teichuronic
1665a	Seq. ID No. 3437	Seq. ID No. 3438	Teichuronic
1668	Seq. ID No. 3439	Seq. ID No. 3440	Teichuronic
1669	Seq. ID No.3441	Seq. ID No.3442	Teichuronic
1670a	Seq. ID No.3443	Seq. ID No.3444	Teichuronic
1670b	Seq. ID No.3445	Seq. ID No.3446	Teichuronic
1670c	Seq. ID No. 3447	Seq. ID No. 3448	Teichuronic
1673a	Seq. ID No.3449	Seq. ID No.3450	Teichuronic
1673b	Seq. ID No.3451	Seq. ID No.3452	Teichuronic
1673c	Seq. ID No.3453	Seq. ID No.3454	Teichuronic
1673d	Seq. ID No.3455	Seq. ID No.3456	Teichuronic
1673e	Seq. ID No.3457	Seq. ID No.3458	Teichuronic
1673f	Seq. ID No. 3459	Seq. ID No. 3460	Teichuronic
1674	Seq. ID No. 3461	Seq. ID No. 3462	Teichuronic
1675a	Seq. ID No.3463	Seq. ID No.3464	Teichuronic
1675b	Seq. ID No.3465	Seq. ID No.3466	Teichuronic
1675c	Seq. ID No. 3467	Seq. ID No. 3468	Teichuronic
1676	Seq. ID No. 3469	Seq. ID No. 3470	Teichuronic
1677	Seq. ID No. 3471	Seq. ID No. 3472	Teichuronic
1679	Seq. ID No. 3473	Seq. ID No. 3474	Teichuronic
1680	Seq. ID No. 3475	Seq. ID No. 3476	Teichuronic

TABLE 15: CAPSULE LOCI

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Locus
1682a	Seq. ID No.3477	Seq. ID No.3478	Teichuronic
1682b	Seq. ID No. 3479	Seq. ID No. 3480	Teichuronic
1683a	Seq. ID No.3481	Seq. ID No.3482	Teichuronic
1683b	Seq. ID No. 3483	Seq. ID No. 3484	Teichuronic
1684	Seq. ID No. 3485	Seq. ID No. 3486	Teichuronic
1685	Seq. ID No. 3487	Seq. ID No. 3488	Teichuronic
1687	Seq. ID No.3489	Seq. ID No. 3490	Teichuronic
1688a	Seq. ID No.3491	Seq. ID No.3492	Teichuronic
1688b	Seq. ID No.3493	Seq. ID No.3494	Teichuronic
1688c	Seq. ID No. 3495	Seq. ID No. 3496	Teichuronic
1689a	Seq. ID No.3497	Seq. ID No.3498	Teichuronic
1689b	Seq. ID No.3499	Seq. ID No.3500	Teichuronic
1689c	Seq. ID No. 3501	Seq. ID No. 3502	Teichuronic
1690a	Seq. ID No.3503	Seq. ID No.3504	Teichuronic
1690b	Seq. ID No. 3505	Seq. ID No. 3506	Teichuronic
1691	Seq. ID No. 3507	Seq. ID No. 3508	Teichuronic
1692	Seq. ID No. 3509	Seq. ID No. 3510	Teichuronic
1693	Seq. ID No. 3511	Seq. ID No. 3512	Teichuronic
1694a	Seq. ID No.3513	Seq. ID No.3514	Teichuronic
1694b	Seq. ID No.3515	Seq. ID No.3516	Teichuronic
1694c	Seq. ID No.3517	Seq. ID No.3518	Teichuronic
1694d	Seq. ID No. 3519	Seq. ID No. 3520	Teichuronic
1696	Seq. ID No. 3521	Seq. ID No. 3522	Teichuronic
1697a	Seq. ID No.3523	Seq. ID No.3524	Teichuronic
1697b	Seq. ID No. 3525	Seq. ID No. 3526	Teichuronic
1699a	Seq. ID No.3527	Seq. ID No.3528	Teichuronic
1699b	Seq. ID No. 3529	Seq. ID No. 3530	Teichuronic
1700a	Seq. ID No.3531	Seq. ID No.3532	Teichuronic
1700b	Seq. ID No. 3533	Seq. ID No. 3534	Teichuronic

**TABLE 15: CAPSULE LOCI**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>	<b>Locus</b>
1701a	Seq. ID No.3535	Seq. ID No.3536	Teichuronic
1701b	Seq. ID No. 3537	Seq. ID No. 3538	Teichuronic
1703b	Seq. ID No.3539	Seq. ID No.3540	Teichuronic
1704a	Seq. ID No.3541	Seq. ID No.3542	Teichuronic
1704b	Seq. ID No. 3543	Seq. ID No. 3544	Teichuronic
1705a	Seq. ID No.3545	Seq. ID No.3546	Teichuronic
1705b	Seq. ID No.3547	Seq. ID No.3548	Teichuronic
1706	Seq. ID No. 3549	Seq. ID No. 3550	Teichuronic
1707a	Seq. ID No.3551	Seq. ID No.3552	Teichuronic
1707b	Seq. ID No. 3553	Seq. ID No. 3554	Teichuronic
1708	Seq. ID No.3555	Seq. ID No.3556	Teichuronic
1709	Seq. ID No.3557	Seq. ID No.3558	Teichuronic
1710a	Seq. ID No.3559	Seq. ID No.3560	Teichuronic
1710b	Seq. ID No. 3561	Seq. ID No. 3562	Teichuronic

Listed in Table 16 are 14 ORFs determined by keyword search of the BlastP results to be associated with sporulation.

**TABLE 16: SPORULATION RELATED PROTEINS**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
524b	Seq. ID No. 1137	Seq. ID No. 1138
683b	Seq. ID No. 1455	Seq. ID No. 1456
1058	Seq. ID No. 2137	Seq. ID No. 2138
1060b	Seq. ID No. 2141	Seq. ID No. 2142
1070b	Seq. ID No. 2165	Seq. ID No. 2166
1077e	Seq. ID No. 2179	Seq. ID No. 2180
1149	Seq. ID No. 2301	Seq. ID No. 2302
1348	Seq. ID No. 2753	Seq. ID No. 2754
2011c	Seq. ID No. 4211	Seq. ID No. 4212
2024d	Seq. ID No. 4251	Seq. ID No. 4252
2065a	Seq. ID No. 4327	Seq. ID No. 4328
2181a	Seq. ID No. 4569	Seq. ID No. 4570
2256	Seq. ID No. 4719	Seq. ID No. 4720
2260c	Seq. ID No. 4729	Seq. ID No. 4730

Listed in Table 17 are the 913 start to stop ORFs which are unique to *Alloioicoccus otitidis*, or 653 unique Stop-Stop ORFs identified as having a BlastP 'E Value' of  $> e^{-10}$  (not identified separately in Table 17).

**TABLE 17: UNIQUE ORFs**

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
4a	Seq. ID No. 7	Seq. ID No. 8
11	Seq. ID No. 19	Seq. ID No. 20
13a	Seq. ID No. 21	Seq. ID No. 22
16	Seq. ID No. 23	Seq. ID No. 24
21b	Seq. ID No. 31	Seq. ID No. 32
32	Seq. ID No. 39	Seq. ID No. 40
44a	Seq. ID No. 65	Seq. ID No. 66
44b	Seq. ID No. 67	Seq. ID No. 68
45	Seq. ID No. 69	Seq. ID No. 70
55	Seq. ID No. 91	Seq. ID No. 92
58	Seq. ID No. 99	Seq. ID No. 100
61	Seq. ID No. 105	Seq. ID No. 106
63a	Seq. ID No. 113	Seq. ID No. 114
63b	Seq. ID No. 115	Seq. ID No. 116
66a	Seq. ID No. 123	Seq. ID No. 124
67	Seq. ID No. 125	Seq. ID No. 126
69	Seq. ID No. 127	Seq. ID No. 128
73a	Seq. ID No. 131	Seq. ID No. 132
73b	Seq. ID No. 133	Seq. ID No. 134
79	Seq. ID No. 139	Seq. ID No. 140
83	Seq. ID No. 151	Seq. ID No. 152
86	Seq. ID No. 159	Seq. ID No. 160
87a	Seq. ID No. 161	Seq. ID No. 162
87b	Seq. ID No. 163	Seq. ID No. 164
87c	Seq. ID No. 165	Seq. ID No. 166

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
89	Seq. ID No. 169	Seq. ID No. 170
94	Seq. ID No. 185	Seq. ID No. 186
97b	Seq. ID No. 189	Seq. ID No. 190
101	Seq. ID No. 193	Seq. ID No. 194
119a	Seq. ID No. 229	Seq. ID No. 230
119b	Seq. ID No. 231	Seq. ID No. 232
132a	Seq. ID No. 255	Seq. ID No. 256
132b	Seq. ID No. 257	Seq. ID No. 258
132c	Seq. ID No. 259	Seq. ID No. 260
142	Seq. ID No. 275	Seq. ID No. 276
163	Seq. ID No. 337	Seq. ID No. 338
164	Seq. ID No. 339	Seq. ID No. 340
169	Seq. ID No. 347	Seq. ID No. 348
170	Seq. ID No. 349	Seq. ID No. 350
173	Seq. ID No. 357	Seq. ID No. 358
174	Seq. ID No. 359	Seq. ID No. 360
179a	Seq. ID No. 369	Seq. ID No. 370
179b	Seq. ID No. 371	Seq. ID No. 372
183a	Seq. ID No. 377	Seq. ID No. 378
187a	Seq. ID No. 385	Seq. ID No. 386
187b	Seq. ID No. 387	Seq. ID No. 388
191b	Seq. ID No. 393	Seq. ID No. 394
193	Seq. ID No. 399	Seq. ID No. 400
194a	Seq. ID No. 401	Seq. ID No. 402
194b	Seq. ID No. 403	Seq. ID No. 404
196	Seq. ID No. 407	Seq. ID No. 408
201a	Seq. ID No. 419	Seq. ID No. 420
207	Seq. ID No. 431	Seq. ID No. 432
235a	Seq. ID No. 477	Seq. ID No. 478

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
241	Seq. ID No. 495	Seq. ID No. 496
247	Seq. ID No. 507	Seq. ID No. 508
253a	Seq. ID No. 519	Seq. ID No. 520
260	Seq. ID No. 541	Seq. ID No. 542
263a	Seq. ID No. 545	Seq. ID No. 546
263b	Seq. ID No. 547	Seq. ID No. 548
264b	Seq. ID No. 549	Seq. ID No. 550
268	Seq. ID No. 557	Seq. ID No. 558
282	Seq. ID No. 589	Seq. ID No. 590
297	Seq. ID No. 617	Seq. ID No. 618
300b	Seq. ID No. 619	Seq. ID No. 620
309	Seq. ID No. 633	Seq. ID No. 634
313a	Seq. ID No. 639	Seq. ID No. 640
313b	Seq. ID No. 641	Seq. ID No. 642
313c	Seq. ID No. 643	Seq. ID No. 644
313d	Seq. ID No. 645	Seq. ID No. 646
313e	Seq. ID No. 647	Seq. ID No. 648
316a	Seq. ID No. 651	Seq. ID No. 652
317a	Seq. ID No. 653	Seq. ID No. 654
317b	Seq. ID No. 655	Seq. ID No. 656
320	Seq. ID No. 667	Seq. ID No. 668
331	Seq. ID No. 691	Seq. ID No. 692
332	Seq. ID No. 693	Seq. ID No. 694
333	Seq. ID No. 695	Seq. ID No. 696
334	Seq. ID No. 697	Seq. ID No. 698
342a	Seq. ID No. 715	Seq. ID No. 716
342b	Seq. ID No. 717	Seq. ID No. 718
342c	Seq. ID No. 719	Seq. ID No. 720
344a	Seq. ID No. 731	Seq. ID No. 732



TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
344b	Seq. ID No. 733	Seq. ID No. 734
347	Seq. ID No. 741	Seq. ID No. 742
349a	Seq. ID No. 743	Seq. ID No. 744
349b	Seq. ID No. 745	Seq. ID No. 746
349c	Seq. ID No. 747	Seq. ID No. 748
350a	Seq. ID No. 749	Seq. ID No. 750
350b	Seq. ID No. 751	Seq. ID No. 752
352a	Seq. ID No. 755	Seq. ID No. 756
352b	Seq. ID No. 757	Seq. ID No. 758
352c	Seq. ID No. 759	Seq. ID No. 760
354a	Seq. ID No. 761	Seq. ID No. 762
354b	Seq. ID No. 763	Seq. ID No. 764
354c	Seq. ID No. 765	Seq. ID No. 766
355	Seq. ID No. 767	Seq. ID No. 768
372a	Seq. ID No. 801	Seq. ID No. 802
372b	Seq. ID No. 803	Seq. ID No. 804
372c	Seq. ID No. 805	Seq. ID No. 806
372d	Seq. ID No. 807	Seq. ID No. 808
374	Seq. ID No. 809	Seq. ID No. 810
377a	Seq. ID No. 811	Seq. ID No. 812
377b	Seq. ID No. 813	Seq. ID No. 814
386	Seq. ID No. 833	Seq. ID No. 834
393b	Seq. ID No. 841	Seq. ID No. 842
396	Seq. ID No. 849	Seq. ID No. 850
398	Seq. ID No. 851	Seq. ID No. 852
400a	Seq. ID No. 853	Seq. ID No. 854
400b	Seq. ID No. 855	Seq. ID No. 856
416a	Seq. ID No. 887	Seq. ID No. 888
416b	Seq. ID No. 889	Seq. ID No. 890

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
417	Seq. ID No. 891	Seq. ID No. 892
420a	Seq. ID No. 903	Seq. ID No. 904
420b	Seq. ID No. 905	Seq. ID No. 906
422	Seq. ID No. 909	Seq. ID No. 910
434	Seq. ID No. 937	Seq. ID No. 938
437b	Seq. ID No. 941	Seq. ID No. 942
437c	Seq. ID No. 943	Seq. ID No. 944
440	Seq. ID No. 951	Seq. ID No. 952
443b	Seq. ID No. 957	Seq. ID No. 958
451a	Seq. ID No. 973	Seq. ID No. 974
451b	Seq. ID No. 975	Seq. ID No. 976
454b	Seq. ID No. 987	Seq. ID No. 988
462	Seq. ID No. 1005	Seq. ID No. 1006
463a	Seq. ID No. 1007	Seq. ID No. 1008
463b	Seq. ID No. 1009	Seq. ID No. 1010
464a	Seq. ID No. 1011	Seq. ID No. 1012
465b	Seq. ID No. 1019	Seq. ID No. 1020
471a	Seq. ID No. 1025	Seq. ID No. 1026
471b	Seq. ID No. 1027	Seq. ID No. 1028
476	Seq. ID No. 1045	Seq. ID No. 1046
477b	Seq. ID No. 1047	Seq. ID No. 1048
491a	Seq. ID No. 1071	Seq. ID No. 1072
491b	Seq. ID No. 1073	Seq. ID No. 1074
494a	Seq. ID No. 1077	Seq. ID No. 1078
507a	Seq. ID No. 1105	Seq. ID No. 1106
507b	Seq. ID No. 1107	Seq. ID No. 1108
510	Seq. ID No. 1111	Seq. ID No. 1112
521b	Seq. ID No. 1131	Seq. ID No. 1132
524a	Seq. ID No. 1135	Seq. ID No. 1136

**TABLE 17: UNIQUE ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
525	Seq. ID No. 1139	Seq. ID No. 1140
530a	Seq. ID No. 1151	Seq. ID No. 1152
530b	Seq. ID No. 1153	Seq. ID No. 1154
541a	Seq. ID No. 1165	Seq. ID No. 1166
541b	Seq. ID No. 1167	Seq. ID No. 1168
541c	Seq. ID No. 1169	Seq. ID No. 1170
541d	Seq. ID No. 1171	Seq. ID No. 1172
542	Seq. ID No. 1173	Seq. ID No. 1174
544	Seq. ID No. 1181	Seq. ID No. 1182
545a	Seq. ID No. 1183	Seq. ID No. 1184
545b	Seq. ID No. 1185	Seq. ID No. 1186
545c	Seq. ID No. 1187	Seq. ID No. 1188
546a	Seq. ID No. 1189	Seq. ID No. 1190
546b	Seq. ID No. 1191	Seq. ID No. 1192
546c	Seq. ID No. 1193	Seq. ID No. 1194
547a	Seq. ID No. 1195	Seq. ID No. 1196
547b	Seq. ID No. 1197	Seq. ID No. 1198
548	Seq. ID No. 1199	Seq. ID No. 1200
549b	Seq. ID No. 1201	Seq. ID No. 1202
550a	Seq. ID No. 1203	Seq. ID No. 1204
553c	Seq. ID No. 1207	Seq. ID No. 1208
556	Seq. ID No. 1213	Seq. ID No. 1214
564a	Seq. ID No. 1227	Seq. ID No. 1228
564b	Seq. ID No. 1229	Seq. ID No. 1230
571	Seq. ID No. 1239	Seq. ID No. 1240
576a	Seq. ID No. 1243	Seq. ID No. 1244
576b	Seq. ID No. 1245	Seq. ID No. 1246
578a	Seq. ID No. 1247	Seq. ID No. 1248
578b	Seq. ID No. 1249	Seq. ID No. 1250

**TABLE 17: UNIQUE ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
585b	Seq. ID No. 1259	Seq. ID No. 1260
587a	Seq. ID No. 1265	Seq. ID No. 1266
587b	Seq. ID No. 1267	Seq. ID No. 1268
587c	Seq. ID No. 1269	Seq. ID No. 1270
587d	Seq. ID No. 1271	Seq. ID No. 1272
588a	Seq. ID No. 1273	Seq. ID No. 1274
588b	Seq. ID No. 1275	Seq. ID No. 1276
589a	Seq. ID No. 1277	Seq. ID No. 1278
589b	Seq. ID No. 1279	Seq. ID No. 1280
590	Seq. ID No. 1281	Seq. ID No. 1282
595a	Seq. ID No. 1283	Seq. ID No. 1284
595b	Seq. ID No. 1285	Seq. ID No. 1286
596a	Seq. ID No. 1287	Seq. ID No. 1288
596b	Seq. ID No. 1289	Seq. ID No. 1290
596c	Seq. ID No. 1291	Seq. ID No. 1292
597	Seq. ID No. 1293	Seq. ID No. 1294
598a	Seq. ID No. 1295	Seq. ID No. 1296
598b	Seq. ID No. 1297	Seq. ID No. 1298
599a	Seq. ID No. 1299	Seq. ID No. 1300
599b	Seq. ID No. 1301	Seq. ID No. 1302
600a	Seq. ID No. 1303	Seq. ID No. 1304
600b	Seq. ID No. 1305	Seq. ID No. 1306
603a	Seq. ID No. 1307	Seq. ID No. 1308
606	Seq. ID No. 1309	Seq. ID No. 1310
607a	Seq. ID No. 1311	Seq. ID No. 1312
607b	Seq. ID No. 1313	Seq. ID No. 1314
610a	Seq. ID No. 1319	Seq. ID No. 1320
610b	Seq. ID No. 1321	Seq. ID No. 1322
611	Seq. ID No. 1323	Seq. ID No. 1324

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
613a	Seq. ID No. 1325	Seq. ID No. 1326
613b	Seq. ID No. 1327	Seq. ID No. 1328
615b	Seq. ID No. 1337	Seq. ID No. 1338
619a	Seq. ID No. 1341	Seq. ID No. 1342
619b	Seq. ID No. 1343	Seq. ID No. 1344
623	Seq. ID No. 1347	Seq. ID No. 1348
624a	Seq. ID No. 1349	Seq. ID No. 1350
624b	Seq. ID No. 1351	Seq. ID No. 1352
624c	Seq. ID No. 1353	Seq. ID No. 1354
625	Seq. ID No. 1355	Seq. ID No. 1356
632b	Seq. ID No. 1371	Seq. ID No. 1372
634b	Seq. ID No. 1379	Seq. ID No. 1380
636	Seq. ID No. 1381	Seq. ID No. 1382
640	Seq. ID No. 1389	Seq. ID No. 1390
644a	Seq. ID No. 1397	Seq. ID No. 1398
644b	Seq. ID No. 1399	Seq. ID No. 1400
645	Seq. ID No. 1401	Seq. ID No. 1402
658a	Seq. ID No. 1417	Seq. ID No. 1418
658b	Seq. ID No. 1419	Seq. ID No. 1420
659a	Seq. ID No. 1421	Seq. ID No. 1422
659b	Seq. ID No. 1423	Seq. ID No. 1424
676	Seq. ID No. 1439	Seq. ID No. 1440
679a	Seq. ID No. 1445	Seq. ID No. 1446
679b	Seq. ID No. 1447	Seq. ID No. 1448
684	Seq. ID No. 1457	Seq. ID No. 1458
690	Seq. ID No. 1465	Seq. ID No. 1466
699b	Seq. ID No. 1479	Seq. ID No. 1480
721	Seq. ID No. 1511	Seq. ID No. 1512
739	Seq. ID No. 1551	Seq. ID No. 1552

**TABLE 17: UNIQUE ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
740	Seq. ID No. 1553	Seq. ID No. 1554
741a	Seq. ID No. 1555	Seq. ID No. 1556
741b	Seq. ID No. 1557	Seq. ID No. 1558
749	Seq. ID No. 1579	Seq. ID No. 1580
764	Seq. ID No. 1609	Seq. ID No. 1610
772a	Seq. ID No. 1621	Seq. ID No. 1622
772b	Seq. ID No. 1623	Seq. ID No. 1624
774	Seq. ID No. 1625	Seq. ID No. 1626
775	Seq. ID No. 1627	Seq. ID No. 1628
777a	Seq. ID No. 1629	Seq. ID No. 1630
777c	Seq. ID No. 1631	Seq. ID No. 1632
779	Seq. ID No. 1633	Seq. ID No. 1634
782b	Seq. ID No. 1639	Seq. ID No. 1640
786b	Seq. ID No. 1643	Seq. ID No. 1644
791	Seq. ID No. 1655	Seq. ID No. 1656
795	Seq. ID No. 1667	Seq. ID No. 1668
799a	Seq. ID No. 1671	Seq. ID No. 1672
808	Seq. ID No. 1693	Seq. ID No. 1694
809b	Seq. ID No. 1695	Seq. ID No. 1696
816	Seq. ID No. 1701	Seq. ID No. 1702
820a	Seq. ID No. 1703	Seq. ID No. 1704
820b	Seq. ID No. 1705	Seq. ID No. 1706
835a	Seq. ID No. 1721	Seq. ID No. 1722
835b	Seq. ID No. 1723	Seq. ID No. 1724
837a	Seq. ID No. 1731	Seq. ID No. 1732
843	Seq. ID No. 1737	Seq. ID No. 1738
848	Seq. ID No. 1743	Seq. ID No. 1744
854	Seq. ID No. 1759	Seq. ID No. 1760
857	Seq. ID No. 1763	Seq. ID No. 1764

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
860	Seq. ID No. 1773	Seq. ID No. 1774
862	Seq. ID No. 1775	Seq. ID No. 1776
863	Seq. ID No. 1777	Seq. ID No. 1778
864a	Seq. ID No. 1779	Seq. ID No. 1780
864b	Seq. ID No. 1781	Seq. ID No. 1782
874a	Seq. ID No. 1799	Seq. ID No. 1800
874b	Seq. ID No. 1801	Seq. ID No. 1802
875	Seq. ID No. 1803	Seq. ID No. 1804
878a	Seq. ID No. 1807	Seq. ID No. 1808
887	Seq. ID No. 1823	Seq. ID No. 1824
894	Seq. ID No. 1831	Seq. ID No. 1832
917	Seq. ID No. 1851	Seq. ID No. 1852
919	Seq. ID No. 1857	Seq. ID No. 1858
931	Seq. ID No. 1875	Seq. ID No. 1876
943	Seq. ID No. 1899	Seq. ID No. 1900
950	Seq. ID No. 1915	Seq. ID No. 1916
955a	Seq. ID No. 1927	Seq. ID No. 1928
955b	Seq. ID No. 1929	Seq. ID No. 1930
978a	Seq. ID No. 1973	Seq. ID No. 1974
979	Seq. ID No. 1977	Seq. ID No. 1978
981a	Seq. ID No. 1981	Seq. ID No. 1982
993	Seq. ID No. 2005	Seq. ID No. 2006
994	Seq. ID No. 2007	Seq. ID No. 2008
995	Seq. ID No. 2009	Seq. ID No. 2010
997	Seq. ID No. 2011	Seq. ID No. 2012
999a	Seq. ID No. 2017	Seq. ID No. 2018
999b	Seq. ID No. 2019	Seq. ID No. 2020
1001	Seq. ID No. 2023	Seq. ID No. 2024
1003a	Seq. ID No. 2025	Seq. ID No. 2026

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1003b	Seq. ID No. 2027	Seq. ID No. 2028
1012	Seq. ID No. 2039	Seq. ID No. 2040
1013a	Seq. ID No. 2041	Seq. ID No. 2042
1013b	Seq. ID No. 2043	Seq. ID No. 2044
1013c	Seq. ID No. 2045	Seq. ID No. 2046
1017a	Seq. ID No. 2049	Seq. ID No. 2050
1035a	Seq. ID No. 2081	Seq. ID No. 2082
1035b	Seq. ID No. 2083	Seq. ID No. 2084
1035c	Seq. ID No. 2085	Seq. ID No. 2086
1044a	Seq. ID No. 2105	Seq. ID No. 2106
1044b	Seq. ID No. 2107	Seq. ID No. 2108
1044c	Seq. ID No. 2109	Seq. ID No. 2110
1044d	Seq. ID No. 2111	Seq. ID No. 2112
1055	Seq. ID No. 2129	Seq. ID No. 2130
1056a	Seq. ID No. 2131	Seq. ID No. 2132
1056b	Seq. ID No. 2133	Seq. ID No. 2134
1063	Seq. ID No. 2145	Seq. ID No. 2146
1066a	Seq. ID No. 2155	Seq. ID No. 2156
1066b	Seq. ID No. 2157	Seq. ID No. 2158
1067	Seq. ID No. 2159	Seq. ID No. 2160
1069	Seq. ID No. 2161	Seq. ID No. 2162
1077a	Seq. ID No. 2171	Seq. ID No. 2172
1081a	Seq. ID No. 2187	Seq. ID No. 2188
1081b	Seq. ID No. 2189	Seq. ID No. 2190
1091a	Seq. ID No. 2201	Seq. ID No. 2202
1091b	Seq. ID No. 2203	Seq. ID No. 2204
1095a	Seq. ID No. 2209	Seq. ID No. 2210
1095b	Seq. ID No. 2211	Seq. ID No. 2212
1097	Seq. ID No. 2219	Seq. ID No. 2220



TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1101a	Seq. ID No. 2225	Seq. ID No. 2226
1112a	Seq. ID No. 2243	Seq. ID No. 2244
1125	Seq. ID No. 2245	Seq. ID No. 2246
1126a	Seq. ID No. 2247	Seq. ID No. 2248
1126b	Seq. ID No. 2249	Seq. ID No. 2250
1126c	Seq. ID No. 2251	Seq. ID No. 2252
1128	Seq. ID No. 2255	Seq. ID No. 2256
1141a	Seq. ID No. 2277	Seq. ID No. 2278
1141b	Seq. ID No. 2279	Seq. ID No. 2280
1162	Seq. ID No. 2341	Seq. ID No. 2342
1168	Seq. ID No. 2351	Seq. ID No. 2352
1169a	Seq. ID No. 2353	Seq. ID No. 2354
1169b	Seq. ID No. 2355	Seq. ID No. 2356
1169c	Seq. ID No. 2357	Seq. ID No. 2358
1170	Seq. ID No. 2359	Seq. ID No. 2360
1172	Seq. ID No. 2365	Seq. ID No. 2366
1173	Seq. ID No. 2367	Seq. ID No. 2368
1175	Seq. ID No. 2371	Seq. ID No. 2372
1178	Seq. ID No. 2375	Seq. ID No. 2376
1182a	Seq. ID No. 2393	Seq. ID No. 2394
1182b	Seq. ID No. 2395	Seq. ID No. 2396
1196a	Seq. ID No. 2425	Seq. ID No. 2426
1196b	Seq. ID No. 2427	Seq. ID No. 2428
1198	Seq. ID No. 2431	Seq. ID No. 2432
1201	Seq. ID No. 2439	Seq. ID No. 2440
1202a	Seq. ID No. 2441	Seq. ID No. 2442
1202b	Seq. ID No. 2443	Seq. ID No. 2444
1206	Seq. ID No. 2447	Seq. ID No. 2448
1212	Seq. ID No. 2459	Seq. ID No. 2460

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1220	Seq. ID No. 2479	Seq. ID No. 2480
1225	Seq. ID No. 2493	Seq. ID No. 2494
1229b	Seq. ID No. 2501	Seq. ID No. 2502
1229c	Seq. ID No. 2503	Seq. ID No. 2504
1235	Seq. ID No. 2521	Seq. ID No. 2522
1236a	Seq. ID No. 2523	Seq. ID No. 2524
1239	Seq. ID No. 2527	Seq. ID No. 2528
1260	Seq. ID No. 2591	Seq. ID No. 2592
1267a	Seq. ID No. 2601	Seq. ID No. 2602
1267b	Seq. ID No. 2603	Seq. ID No. 2604
1270	Seq. ID No. 2611	Seq. ID No. 2612
1278a	Seq. ID No. 2627	Seq. ID No. 2628
1278b	Seq. ID No. 2629	Seq. ID No. 2630
1289	Seq. ID No. 2653	Seq. ID No. 2654
1294a	Seq. ID No. 2661	Seq. ID No. 2662
1314b	Seq. ID No. 2691	Seq. ID No. 2692
1316	Seq. ID No. 2695	Seq. ID No. 2696
1317	Seq. ID No. 2697	Seq. ID No. 2698
1323b	Seq. ID No. 2717	Seq. ID No. 2718
1334a	Seq. ID No. 2729	Seq. ID No. 2730
1334b	Seq. ID No. 2731	Seq. ID No. 2732
1335a	Seq. ID No. 2733	Seq. ID No. 2734
1335b	Seq. ID No. 2735	Seq. ID No. 2736
1338	Seq. ID No. 2739	Seq. ID No. 2740
1340a	Seq. ID No. 2741	Seq. ID No. 2742
1340b	Seq. ID No. 2743	Seq. ID No. 2744
1364a	Seq. ID No. 2777	Seq. ID No. 2778
1364b	Seq. ID No. 2779	Seq. ID No. 2780
1364c	Seq. ID No. 2781	Seq. ID No. 2782

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1365b	Seq. ID No. 2783	Seq. ID No. 2784
1375	Seq. ID No. 2801	Seq. ID No. 2802
1378	Seq. ID No. 2805	Seq. ID No. 2806
1379	Seq. ID No. 2807	Seq. ID No. 2808
1380	Seq. ID No. 2809	Seq. ID No. 2810
1381a	Seq. ID No. 2811	Seq. ID No. 2812
1381b	Seq. ID No. 2813	Seq. ID No. 2814
1382	Seq. ID No. 2815	Seq. ID No. 2816
1383	Seq. ID No. 2817	Seq. ID No. 2818
1384a	Seq. ID No. 2819	Seq. ID No. 2820
1387a	Seq. ID No. 2829	Seq. ID No. 2830
1388b	Seq. ID No. 2831	Seq. ID No. 2832
1389a	Seq. ID No. 2833	Seq. ID No. 2834
1393a	Seq. ID No. 2835	Seq. ID No. 2836
1393b	Seq. ID No. 2837	Seq. ID No. 2838
1393c	Seq. ID No. 2839	Seq. ID No. 2840
1393d	Seq. ID No. 2841	Seq. ID No. 2842
1395a	Seq. ID No. 2845	Seq. ID No. 2846
1397	Seq. ID No. 2849	Seq. ID No. 2850
1398	Seq. ID No. 2851	Seq. ID No. 2852
1399a	Seq. ID No. 2853	Seq. ID No. 2854
1399b	Seq. ID No. 2855	Seq. ID No. 2856
1400	Seq. ID No. 2857	Seq. ID No. 2858
1401	Seq. ID No. 2859	Seq. ID No. 2860
1402c	Seq. ID No. 2861	Seq. ID No. 2862
1407b	Seq. ID No. 2865	Seq. ID No. 2866
1411a	Seq. ID No. 2873	Seq. ID No. 2874
1411b	Seq. ID No. 2875	Seq. ID No. 2876
1411c	Seq. ID No. 2877	Seq. ID No. 2878

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1414a	Seq. ID No. 2883	Seq. ID No. 2884
1414b	Seq. ID No. 2885	Seq. ID No. 2886
1414c	Seq. ID No. 2887	Seq. ID No. 2888
1415	Seq. ID No. 2889	Seq. ID No. 2890
1418	Seq. ID No. 2893	Seq. ID No. 2894
1419	Seq. ID No. 2895	Seq. ID No. 2896
1423	Seq. ID No. 2903	Seq. ID No. 2904
1427a	Seq. ID No. 2909	Seq. ID No. 2910
1438	Seq. ID No. 2935	Seq. ID No. 2936
1439a	Seq. ID No. 2937	Seq. ID No. 2938
1439b	Seq. ID No. 2939	Seq. ID No. 2940
1439c	Seq. ID No. 2941	Seq. ID No. 2942
1439d	Seq. ID No. 2943	Seq. ID No. 2944
1439e	Seq. ID No. 2945	Seq. ID No. 2946
1440a	Seq. ID No. 2947	Seq. ID No. 2948
1440b	Seq. ID No. 2949	Seq. ID No. 2950
1440c	Seq. ID No. 2951	Seq. ID No. 2952
1440d	Seq. ID No. 2953	Seq. ID No. 2954
1446a	Seq. ID No. 2965	Seq. ID No. 2966
1446b	Seq. ID No. 2967	Seq. ID No. 2968
1448	Seq. ID No. 2973	Seq. ID No. 2974
1449a	Seq. ID No. 2975	Seq. ID No. 2976
1449b	Seq. ID No. 2977	Seq. ID No. 2978
1452a	Seq. ID No. 2981	Seq. ID No. 2982
1452b	Seq. ID No. 2983	Seq. ID No. 2984
1453	Seq. ID No. 2985	Seq. ID No. 2986
1454	Seq. ID No. 2987	Seq. ID No. 2988
1455a	Seq. ID No. 2989	Seq. ID No. 2990
1455b	Seq. ID No. 2991	Seq. ID No. 2992

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1459	Seq. ID No. 3001	Seq. ID No. 3002
1463a	Seq. ID No. 3007	Seq. ID No. 3008
1463b	Seq. ID No. 3009	Seq. ID No. 3010
1463c	Seq. ID No. 3011	Seq. ID No. 3012
1467	Seq. ID No. 3021	Seq. ID No. 3022
1469a	Seq. ID No. 3023	Seq. ID No. 3024
1474	Seq. ID No. 3041	Seq. ID No. 3042
1476	Seq. ID No. 3045	Seq. ID No. 3046
1487	Seq. ID No. 3071	Seq. ID No. 3072
1489	Seq. ID No. 3087	Seq. ID No. 3088
1502a	Seq. ID No. 3105	Seq. ID No. 3106
1502b	Seq. ID No. 3107	Seq. ID No. 3108
1507a	Seq. ID No. 3119	Seq. ID No. 3120
1507b	Seq. ID No. 3121	Seq. ID No. 3122
1507c	Seq. ID No. 3123	Seq. ID No. 3124
1518a	Seq. ID No. 3151	Seq. ID No. 3152
1518b	Seq. ID No. 3153	Seq. ID No. 3154
1533a	Seq. ID No. 3167	Seq. ID No. 3168
1535a	Seq. ID No. 3173	Seq. ID No. 3174
1536a	Seq. ID No. 3175	Seq. ID No. 3176
1536b	Seq. ID No. 3177	Seq. ID No. 3178
1542	Seq. ID No. 3181	Seq. ID No. 3182
1552	Seq. ID No. 3193	Seq. ID No. 3194
1557a	Seq. ID No. 3213	Seq. ID No. 3214
1557b	Seq. ID No. 3215	Seq. ID No. 3216
1557c	Seq. ID No. 3217	Seq. ID No. 3218
1559a	Seq. ID No. 3219	Seq. ID No. 3220
1559b	Seq. ID No. 3221	Seq. ID No. 3222
1563	Seq. ID No. 3223	Seq. ID No. 3224

**TABLE 17: UNIQUE ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1567	Seq. ID No. 3231	Seq. ID No. 3232
1568b	Seq. ID No. 3233	Seq. ID No. 3234
1569	Seq. ID No. 3235	Seq. ID No. 3236
1570	Seq. ID No. 3237	Seq. ID No. 3238
1571	Seq. ID No. 3239	Seq. ID No. 3240
1572a	Seq. ID No. 3241	Seq. ID No. 3242
1572b	Seq. ID No. 3243	Seq. ID No. 3244
1572c	Seq. ID No. 3245	Seq. ID No. 3246
1572d	Seq. ID No. 3247	Seq. ID No. 3248
1572e	Seq. ID No. 3249	Seq. ID No. 3250
1580a	Seq. ID No. 3261	Seq. ID No. 3262
1580b	Seq. ID No. 3263	Seq. ID No. 3264
1581	Seq. ID No. 3265	Seq. ID No. 3266
1582a	Seq. ID No. 3267	Seq. ID No. 3268
1582b	Seq. ID No. 3269	Seq. ID No. 3270
1582c	Seq. ID No. 3271	Seq. ID No. 3272
1584	Seq. ID No. 3273	Seq. ID No. 3274
1585a	Seq. ID No. 3275	Seq. ID No. 3276
1585b	Seq. ID No. 3277	Seq. ID No. 3278
1608	Seq. ID No. 3325	Seq. ID No. 3326
1612	Seq. ID No. 3331	Seq. ID No. 3332
1621	Seq. ID No. 3339	Seq. ID No. 3340
1622a	Seq. ID No. 3341	Seq. ID No. 3342
1624	Seq. ID No. 3349	Seq. ID No. 3350
1628a	Seq. ID No. 3361	Seq. ID No. 3362
1628b	Seq. ID No. 3363	Seq. ID No. 3364
1633a	Seq. ID No. 3369	Seq. ID No. 3370
1633b	Seq. ID No. 3371	Seq. ID No. 3372
1646a	Seq. ID No. 3389	Seq. ID No. 3390

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1648b	Seq. ID No. 3403	Seq. ID No. 3404
1656b	Seq. ID No. 3417	Seq. ID No. 3418
1657	Seq. ID No. 3419	Seq. ID No. 3420
1659a	Seq. ID No. 3421	Seq. ID No. 3422
1663	Seq. ID No. 3433	Seq. ID No. 3434
1665a	Seq. ID No. 3437	Seq. ID No. 3438
1669	Seq. ID No. 3441	Seq. ID No. 3442
1670a	Seq. ID No. 3443	Seq. ID No. 3444
1670b	Seq. ID No. 3445	Seq. ID No. 3446
1670c	Seq. ID No. 3447	Seq. ID No. 3448
1679	Seq. ID No. 3473	Seq. ID No. 3474
1683a	Seq. ID No. 3481	Seq. ID No. 3482
1683b	Seq. ID No. 3483	Seq. ID No. 3484
1687	Seq. ID No. 3489	Seq. ID No. 3490
1690a	Seq. ID No. 3503	Seq. ID No. 3504
1690b	Seq. ID No. 3505	Seq. ID No. 3506
1692	Seq. ID No. 3509	Seq. ID No. 3510
1693	Seq. ID No. 3511	Seq. ID No. 3512
1697a	Seq. ID No. 3523	Seq. ID No. 3524
1697b	Seq. ID No. 3525	Seq. ID No. 3526
1700a	Seq. ID No. 3531	Seq. ID No. 3532
1700b	Seq. ID No. 3533	Seq. ID No. 3534
1703b	Seq. ID No. 3539	Seq. ID No. 3540
1704a	Seq. ID No. 3541	Seq. ID No. 3542
1704b	Seq. ID No. 3543	Seq. ID No. 3544
1705a	Seq. ID No. 3545	Seq. ID No. 3546
1705b	Seq. ID No. 3547	Seq. ID No. 3548
1708	Seq. ID No. 3555	Seq. ID No. 3556
1709	Seq. ID No. 3557	Seq. ID No. 3558

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1712a	Seq. ID No. 3563	Seq. ID No. 3564
1712b	Seq. ID No. 3565	Seq. ID No. 3566
1718a	Seq. ID No. 3571	Seq. ID No. 3572
1718b	Seq. ID No. 3573	Seq. ID No. 3574
1724	Seq. ID No. 3581	Seq. ID No. 3582
1731	Seq. ID No. 3587	Seq. ID No. 3588
1734	Seq. ID No. 3591	Seq. ID No. 3592
1735a	Seq. ID No. 3593	Seq. ID No. 3594
1735b	Seq. ID No. 3595	Seq. ID No. 3596
1743	Seq. ID No. 3611	Seq. ID No. 3612
1744a	Seq. ID No. 3613	Seq. ID No. 3614
1745	Seq. ID No. 3617	Seq. ID No. 3618
1747	Seq. ID No. 3619	Seq. ID No. 3620
1749a	Seq. ID No. 3621	Seq. ID No. 3622
1749b	Seq. ID No. 3623	Seq. ID No. 3624
1750a	Seq. ID No. 3625	Seq. ID No. 3626
1753	Seq. ID No. 3631	Seq. ID No. 3632
1757a	Seq. ID No. 3637	Seq. ID No. 3638
1757b	Seq. ID No. 3639	Seq. ID No. 3640
1766	Seq. ID No. 3655	Seq. ID No. 3656
1767a	Seq. ID No. 3657	Seq. ID No. 3658
1767b	Seq. ID No. 3659	Seq. ID No. 3660
1769a	Seq. ID No. 3661	Seq. ID No. 3662
1778a	Seq. ID No. 3677	Seq. ID No. 3678
1778b	Seq. ID No. 3679	Seq. ID No. 3680
1783a	Seq. ID No. 3683	Seq. ID No. 3684
1783b	Seq. ID No. 3685	Seq. ID No. 3686
1790a	Seq. ID No. 3701	Seq. ID No. 3702
1790b	Seq. ID No. 3703	Seq. ID No. 3704



TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1794a	Seq. ID No. 3717	Seq. ID No. 3718
1797a	Seq. ID No. 3719	Seq. ID No. 3720
1797b	Seq. ID No. 3721	Seq. ID No. 3722
1798a	Seq. ID No. 3723	Seq. ID No. 3724
1800	Seq. ID No. 3729	Seq. ID No. 3730
1802a	Seq. ID No. 3731	Seq. ID No. 3732
1802b	Seq. ID No. 3733	Seq. ID No. 3734
1803	Seq. ID No. 3735	Seq. ID No. 3736
1804a	Seq. ID No. 3737	Seq. ID No. 3738
1804b	Seq. ID No. 3739	Seq. ID No. 3740
1805	Seq. ID No. 3741	Seq. ID No. 3742
1807a	Seq. ID No. 3749	Seq. ID No. 3750
1807b	Seq. ID No. 3751	Seq. ID No. 3752
1808a	Seq. ID No. 3753	Seq. ID No. 3754
1808b	Seq. ID No. 3755	Seq. ID No. 3756
1809a	Seq. ID No. 3761	Seq. ID No. 3762
1812a	Seq. ID No. 3781	Seq. ID No. 3782
1812b	Seq. ID No. 3783	Seq. ID No. 3784
1813	Seq. ID No. 3785	Seq. ID No. 3786
1815a	Seq. ID No. 3787	Seq. ID No. 3788
1815b	Seq. ID No. 3789	Seq. ID No. 3790
1815c	Seq. ID No. 3791	Seq. ID No. 3792
1817a	Seq. ID No. 3799	Seq. ID No. 3800
1822	Seq. ID No. 3807	Seq. ID No. 3808
1823a	Seq. ID No. 3809	Seq. ID No. 3810
1823b	Seq. ID No. 3811	Seq. ID No. 3812
1825	Seq. ID No. 3813	Seq. ID No. 3814
1826a	Seq. ID No. 3815	Seq. ID No. 3816
1826b	Seq. ID No. 3817	Seq. ID No. 3818

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1834	Seq. ID No. 3827	Seq. ID No. 3828
1835	Seq. ID No. 3829	Seq. ID No. 3830
1836a	Seq. ID No. 3831	Seq. ID No. 3832
1836b	Seq. ID No. 3833	Seq. ID No. 3834
1837	Seq. ID No. 3835	Seq. ID No. 3836
1842a	Seq. ID No. 3849	Seq. ID No. 3850
1854a	Seq. ID No. 3879	Seq. ID No. 3880
1854b	Seq. ID No. 3881	Seq. ID No. 3882
1858	Seq. ID No. 3895	Seq. ID No. 3896
1862a	Seq. ID No. 3903	Seq. ID No. 3904
1864a	Seq. ID No. 3909	Seq. ID No. 3910
1868	Seq. ID No. 3915	Seq. ID No. 3916
1882	Seq. ID No. 3939	Seq. ID No. 3940
1894c	Seq. ID No. 3959	Seq. ID No. 3960
1895	Seq. ID No. 3961	Seq. ID No. 3962
1896a	Seq. ID No. 3963	Seq. ID No. 3964
1896b	Seq. ID No. 3965	Seq. ID No. 3966
1898a	Seq. ID No. 3973	Seq. ID No. 3974
1899	Seq. ID No. 3977	Seq. ID No. 3978
1900	Seq. ID No. 3979	Seq. ID No. 3980
1916	Seq. ID No. 3993	Seq. ID No. 3994
1917a	Seq. ID No. 3995	Seq. ID No. 3996
1917b	Seq. ID No. 3997	Seq. ID No. 3998
1919a	Seq. ID No. 4005	Seq. ID No. 4006
1919b	Seq. ID No. 4007	Seq. ID No. 4008
1919c	Seq. ID No. 4009	Seq. ID No. 4010
1937a	Seq. ID No. 4041	Seq. ID No. 4042
1937b	Seq. ID No. 4043	Seq. ID No. 4044
1937c	Seq. ID No. 4045	Seq. ID No. 4046

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1944	Seq. ID No. 4069	Seq. ID No. 4070
1949	Seq. ID No. 4077	Seq. ID No. 4078
1956	Seq. ID No. 4097	Seq. ID No. 4098
1961	Seq. ID No. 4113	Seq. ID No. 4114
1966	Seq. ID No. 4123	Seq. ID No. 4124
1970a	Seq. ID No. 4131	Seq. ID No. 4132
1970b	Seq. ID No. 4133	Seq. ID No. 4134
1972	Seq. ID No. 4135	Seq. ID No. 4136
1976	Seq. ID No. 4139	Seq. ID No. 4140
1980a	Seq. ID No. 4151	Seq. ID No. 4152
1980b	Seq. ID No. 4153	Seq. ID No. 4154
1981	Seq. ID No. 4155	Seq. ID No. 4156
1991	Seq. ID No. 4181	Seq. ID No. 4182
2016a	Seq. ID No. 4221	Seq. ID No. 4222
2023a	Seq. ID No. 4241	Seq. ID No. 4242
2025	Seq. ID No. 4253	Seq. ID No. 4254
2030a	Seq. ID No. 4257	Seq. ID No. 4258
2030b	Seq. ID No. 4259	Seq. ID No. 4260
2030c	Seq. ID No. 4261	Seq. ID No. 4262
2030d	Seq. ID No. 4263	Seq. ID No. 4264
2032c	Seq. ID No. 4265	Seq. ID No. 4266
2035b	Seq. ID No. 4269	Seq. ID No. 4270
2038a	Seq. ID No. 4275	Seq. ID No. 4276
2040a	Seq. ID No. 4277	Seq. ID No. 4278
2042	Seq. ID No. 4279	Seq. ID No. 4280
2043b	Seq. ID No. 4281	Seq. ID No. 4282
2045a	Seq. ID No. 4285	Seq. ID No. 4286
2045b	Seq. ID No. 4287	Seq. ID No. 4288
2049c	Seq. ID No. 4297	Seq. ID No. 4298

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2055	Seq. ID No. 4305	Seq. ID No. 4306
2056	Seq. ID No. 4307	Seq. ID No. 4308
2081a	Seq. ID No. 4363	Seq. ID No. 4364
2081b	Seq. ID No. 4365	Seq. ID No. 4366
2087a	Seq. ID No. 4371	Seq. ID No. 4372
2087b	Seq. ID No. 4373	Seq. ID No. 4374
2098b	Seq. ID No. 4395	Seq. ID No. 4396
2101	Seq. ID No. 4399	Seq. ID No. 4400
2105	Seq. ID No. 4403	Seq. ID No. 4404
2114b	Seq. ID No. 4425	Seq. ID No. 4426
2120a	Seq. ID No. 4437	Seq. ID No. 4438
2120b	Seq. ID No. 4439	Seq. ID No. 4440
2122b	Seq. ID No. 4441	Seq. ID No. 4442
2127a	Seq. ID No. 4453	Seq. ID No. 4454
2127b	Seq. ID No. 4455	Seq. ID No. 4456
2159a	Seq. ID No. 4513	Seq. ID No. 4514
2159b	Seq. ID No. 4515	Seq. ID No. 4516
2175	Seq. ID No. 4551	Seq. ID No. 4552
2177b	Seq. ID No. 4561	Seq. ID No. 4562
2182	Seq. ID No. 4573	Seq. ID No. 4574
2183	Seq. ID No. 4575	Seq. ID No. 4576
2190a	Seq. ID No. 4587	Seq. ID No. 4588
2190b	Seq. ID No. 4589	Seq. ID No. 4590
2193	Seq. ID No. 4591	Seq. ID No. 4592
2194a	Seq. ID No. 4593	Seq. ID No. 4594
2194c	Seq. ID No. 4595	Seq. ID No. 4596
2208a	Seq. ID No. 4617	Seq. ID No. 4618
2208b	Seq. ID No. 4619	Seq. ID No. 4620
2208c	Seq. ID No. 4621	Seq. ID No. 4622

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2212a	Seq. ID No. 4625	Seq. ID No. 4626
2212b	Seq. ID No. 4627	Seq. ID No. 4628
2216a	Seq. ID No. 4633	Seq. ID No. 4634
2216b	Seq. ID No. 4635	Seq. ID No. 4636
2218	Seq. ID No. 4637	Seq. ID No. 4638
2219a	Seq. ID No. 4639	Seq. ID No. 4640
2225	Seq. ID No. 4659	Seq. ID No. 4660
2236a	Seq. ID No. 4681	Seq. ID No. 4682
2239b	Seq. ID No. 4687	Seq. ID No. 4688
2243a	Seq. ID No. 4695	Seq. ID No. 4696
2245	Seq. ID No. 4699	Seq. ID No. 4700
2246	Seq. ID No. 4701	Seq. ID No. 4702
2257	Seq. ID No. 4721	Seq. ID No. 4722
2264a	Seq. ID No. 4735	Seq. ID No. 4736
2264b	Seq. ID No. 4737	Seq. ID No. 4738
2268	Seq. ID No. 4741	Seq. ID No. 4742
2285	Seq. ID No. 4783	Seq. ID No. 4784
2288	Seq. ID No. 4789	Seq. ID No. 4790
2294	Seq. ID No. 4805	Seq. ID No. 4806
2299	Seq. ID No. 4811	Seq. ID No. 4812
2302	Seq. ID No. 4817	Seq. ID No. 4818
2303	Seq. ID No. 4819	Seq. ID No. 4820
2304	Seq. ID No. 4821	Seq. ID No. 4822
2306c	Seq. ID No. 4823	Seq. ID No. 4824
2310	Seq. ID No. 4835	Seq. ID No. 4836
2320	Seq. ID No. 4853	Seq. ID No. 4854
2336	Seq. ID No. 4885	Seq. ID No. 4886
2350a	Seq. ID No. 4913	Seq. ID No. 4914
2360	Seq. ID No. 4923	Seq. ID No. 4924

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2371a	Seq. ID No. 4949	Seq. ID No. 4950
2372	Seq. ID No. 4951	Seq. ID No. 4952
2382c	Seq. ID No. 4975	Seq. ID No. 4976
2386b	Seq. ID No. 4981	Seq. ID No. 4982
2386c	Seq. ID No. 4983	Seq. ID No. 4984
2390	Seq. ID No. 4987	Seq. ID No. 4988
2394	Seq. ID No. 4993	Seq. ID No. 4994
2397	Seq. ID No. 4999	Seq. ID No. 5000
2398	Seq. ID No. 5001	Seq. ID No. 5002
2402a	Seq. ID No. 5011	Seq. ID No. 5012
2402b	Seq. ID No. 5013	Seq. ID No. 5014
2407a	Seq. ID No. 5023	Seq. ID No. 5024
2412	Seq. ID No. 5031	Seq. ID No. 5032
2413a	Seq. ID No. 5033	Seq. ID No. 5034
2413b	Seq. ID No. 5035	Seq. ID No. 5036
2415a	Seq. ID No. 5037	Seq. ID No. 5038
2416b	Seq. ID No. 5041	Seq. ID No. 5042
2416c	Seq. ID No. 5043	Seq. ID No. 5044
2420	Seq. ID No. 5053	Seq. ID No. 5054
2423a	Seq. ID No. 5061	Seq. ID No. 5062
2423b	Seq. ID No. 5063	Seq. ID No. 5064
2434	Seq. ID No. 5085	Seq. ID No. 5086
2443	Seq. ID No. 5093	Seq. ID No. 5094
2463a	Seq. ID No. 5151	Seq. ID No. 5152
2464	Seq. ID No. 5153	Seq. ID No. 5154
2468a	Seq. ID No. 5159	Seq. ID No. 5160
2468b	Seq. ID No. 5161	Seq. ID No. 5162
2470	Seq. ID No. 5167	Seq. ID No. 5168
2474a	Seq. ID No. 5173	Seq. ID No. 5174

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2474b	Seq. ID No. 5175	Seq. ID No. 5176
2474c	Seq. ID No. 5177	Seq. ID No. 5178
2481a	Seq. ID No. 5189	Seq. ID No. 5190
2481b	Seq. ID No. 5191	Seq. ID No. 5192
2482	Seq. ID No. 5193	Seq. ID No. 5194
2484a	Seq. ID No. 5197	Seq. ID No. 5198
2484b	Seq. ID No. 5199	Seq. ID No. 5200
2498b	Seq. ID No. 5221	Seq. ID No. 5222
2500a	Seq. ID No. 5223	Seq. ID No. 5224
2500b	Seq. ID No. 5225	Seq. ID No. 5226
2500c	Seq. ID No. 5227	Seq. ID No. 5228
2505	Seq. ID No. 5237	Seq. ID No. 5238
2518a	Seq. ID No. 5267	Seq. ID No. 5268
2519a	Seq. ID No. 5269	Seq. ID No. 5270
2519b	Seq. ID No. 5271	Seq. ID No. 5272
2521	Seq. ID No. 5281	Seq. ID No. 5282
2532b	Seq. ID No. 5301	Seq. ID No. 5302
2532c	Seq. ID No. 5303	Seq. ID No. 5304
2542a	Seq. ID No. 5315	Seq. ID No. 5316
2543	Seq. ID No. 5321	Seq. ID No. 5322
2546	Seq. ID No. 5327	Seq. ID No. 5328
2553	Seq. ID No. 5347	Seq. ID No. 5348
2567a	Seq. ID No. 5385	Seq. ID No. 5386
2605a	Seq. ID No. 5445	Seq. ID No. 5446
2605b	Seq. ID No. 5447	Seq. ID No. 5448
2616a	Seq. ID No. 5459	Seq. ID No. 5460
2616d	Seq. ID No. 5465	Seq. ID No. 5466
2616e	Seq. ID No. 5467	Seq. ID No. 5468
2618a	Seq. ID No. 5479	Seq. ID No. 5480

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2618b	Seq. ID No. 5481	Seq. ID No. 5482
2620	Seq. ID No. 5485	Seq. ID No. 5486
2621a	Seq. ID No. 5487	Seq. ID No. 5488
2631	Seq. ID No. 5515	Seq. ID No. 5516
2632	Seq. ID No. 5517	Seq. ID No. 5518
2642	Seq. ID No. 5533	Seq. ID No. 5534
2648a	Seq. ID No. 5543	Seq. ID No. 5544
2648b	Seq. ID No. 5545	Seq. ID No. 5546
2650	Seq. ID No. 5549	Seq. ID No. 5550
2660	Seq. ID No. 5569	Seq. ID No. 5570
2665	Seq. ID No. 5577	Seq. ID No. 5578
2672	Seq. ID No. 5593	Seq. ID No. 5594
2673	Seq. ID No. 5595	Seq. ID No. 5596
2679a	Seq. ID No. 5609	Seq. ID No. 5610
2683a	Seq. ID No. 5623	Seq. ID No. 5624
2683b	Seq. ID No. 5625	Seq. ID No. 5626
2689a	Seq. ID No. 5639	Seq. ID No. 5640
2689b	Seq. ID No. 5641	Seq. ID No. 5642
2690a	Seq. ID No. 5643	Seq. ID No. 5644
2692b	Seq. ID No. 5649	Seq. ID No. 5650
2696a	Seq. ID No. 5659	Seq. ID No. 5660
2696b	Seq. ID No. 5661	Seq. ID No. 5662
2705	Seq. ID No. 5663	Seq. ID No. 5664
2710c	Seq. ID No. 5667	Seq. ID No. 5668
2713	Seq. ID No. 5671	Seq. ID No. 5672
2719a	Seq. ID No. 5687	Seq. ID No. 5688
2719b	Seq. ID No. 5689	Seq. ID No. 5690
2725a	Seq. ID No. 5703	Seq. ID No. 5704
2725b	Seq. ID No. 5705	Seq. ID No. 5706



**TABLE 17: UNIQUE ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2728a	Seq. ID No. 5709	Seq. ID No. 5710
2728b	Seq. ID No. 5711	Seq. ID No. 5712
2742a	Seq. ID No. 5737	Seq. ID No. 5738
2742b	Seq. ID No. 5739	Seq. ID No. 5740
2744	Seq. ID No. 5745	Seq. ID No. 5746
2746	Seq. ID No. 5751	Seq. ID No. 5752
2749a	Seq. ID No. 5763	Seq. ID No. 5764
2760a	Seq. ID No. 5797	Seq. ID No. 5798
2764	Seq. ID No. 5811	Seq. ID No. 5812
2765b	Seq. ID No. 5813	Seq. ID No. 5814
2765c	Seq. ID No. 5815	Seq. ID No. 5816
2769a	Seq. ID No. 5827	Seq. ID No. 5828
2770	Seq. ID No. 5829	Seq. ID No. 5830
2776a	Seq. ID No. 5843	Seq. ID No. 5844
2776b	Seq. ID No. 5845	Seq. ID No. 5846
2788b	Seq. ID No. 5873	Seq. ID No. 5874
2791	Seq. ID No. 5879	Seq. ID No. 5880
2794	Seq. ID No. 5883	Seq. ID No. 5884
2796a	Seq. ID No. 5885	Seq. ID No. 5886
2798	Seq. ID No. 5887	Seq. ID No. 5888
2799a	Seq. ID No. 5889	Seq. ID No. 5890
2799b	Seq. ID No. 5891	Seq. ID No. 5892
2819	Seq. ID No. 5931	Seq. ID No. 5932
2832	Seq. ID No. 5955	Seq. ID No. 5956
2837a	Seq. ID No. 5963	Seq. ID No. 5964
2837b	Seq. ID No. 5965	Seq. ID No. 5966
2845	Seq. ID No. 5975	Seq. ID No. 5976
2850	Seq. ID No. 5983	Seq. ID No. 5984
2851	Seq. ID No. 5985	Seq. ID No. 5986

**TABLE 17: UNIQUE ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2852	Seq. ID No. 5987	Seq. ID No. 5988
2853	Seq. ID No. 5989	Seq. ID No. 5990
2859	Seq. ID No. 6005	Seq. ID No. 6006
2862	Seq. ID No. 6013	Seq. ID No. 6014
2872	Seq. ID No. 6031	Seq. ID No. 6032
2877	Seq. ID No. 6035	Seq. ID No. 6036
2882	Seq. ID No. 6045	Seq. ID No. 6046
2887a	Seq. ID No. 6059	Seq. ID No. 6060
2887b	Seq. ID No. 6061	Seq. ID No. 6062
2888	Seq. ID No. 6063	Seq. ID No. 6064
2893b	Seq. ID No. 6073	Seq. ID No. 6074
2895	Seq. ID No. 6081	Seq. ID No. 6082
2901a	Seq. ID No. 6091	Seq. ID No. 6092
2901b	Seq. ID No. 6093	Seq. ID No. 6094
2917	Seq. ID No. 6127	Seq. ID No. 6128
2929b	Seq. ID No. 6159	Seq. ID No. 6160
2944b	Seq. ID No. 6197	Seq. ID No. 6198
2945b	Seq. ID No. 6199	Seq. ID No. 6200
2948a	Seq. ID No. 6203	Seq. ID No. 6204
2952	Seq. ID No. 6217	Seq. ID No. 6218
2955a	Seq. ID No. 6221	Seq. ID No. 6222
2955b	Seq. ID No. 6223	Seq. ID No. 6224
2958a	Seq. ID No. 6237	Seq. ID No. 6238
2958b	Seq. ID No. 6239	Seq. ID No. 6240
2958c	Seq. ID No. 6241	Seq. ID No. 6242
2960a	Seq. ID No. 6245	Seq. ID No. 6246
2962a	Seq. ID No. 6247	Seq. ID No. 6248
2962b	Seq. ID No. 6249	Seq. ID No. 6250
2966	Seq. ID No. 6259	Seq. ID No. 6260

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2970a	Seq. ID No. 6265	Seq. ID No. 6266
2970b	Seq. ID No. 6267	Seq. ID No. 6268
2974a	Seq. ID No. 6273	Seq. ID No. 6274
2978a	Seq. ID No. 6283	Seq. ID No. 6284
2978b	Seq. ID No. 6285	Seq. ID No. 6286
2992	Seq. ID No. 6323	Seq. ID No. 6324
2993a	Seq. ID No. 6325	Seq. ID No. 6326
2993b	Seq. ID No. 6327	Seq. ID No. 6328
3015	Seq. ID No. 6361	Seq. ID No. 6362
3016a	Seq. ID No. 6363	Seq. ID No. 6364
3021	Seq. ID No. 6377	Seq. ID No. 6378
3023	Seq. ID No. 6381	Seq. ID No. 6382
3031a	Seq. ID No. 6401	Seq. ID No. 6402
3031b	Seq. ID No. 6403	Seq. ID No. 6404
3038	Seq. ID No. 6419	Seq. ID No. 6420
3042a	Seq. ID No. 6425	Seq. ID No. 6426
3042b	Seq. ID No. 6427	Seq. ID No. 6428
3043a	Seq. ID No. 6429	Seq. ID No. 6430
3043b	Seq. ID No. 6431	Seq. ID No. 6432
3044	Seq. ID No. 6433	Seq. ID No. 6434
3045a	Seq. ID No. 6435	Seq. ID No. 6436
3045b	Seq. ID No. 6437	Seq. ID No. 6438
3048a	Seq. ID No. 6439	Seq. ID No. 6440
3051a	Seq. ID No. 6447	Seq. ID No. 6448
3051b	Seq. ID No. 6449	Seq. ID No. 6450
3052	Seq. ID No. 6451	Seq. ID No. 6452
3054	Seq. ID No. 6453	Seq. ID No. 6454
3055a	Seq. ID No. 6455	Seq. ID No. 6456
3055b	Seq. ID No. 6457	Seq. ID No. 6458

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3061	Seq. ID No. 6465	Seq. ID No. 6466
3062	Seq. ID No. 6467	Seq. ID No. 6468
3063a	Seq. ID No. 6469	Seq. ID No. 6470
3063b	Seq. ID No. 6471	Seq. ID No. 6472
3064b	Seq. ID No. 6473	Seq. ID No. 6474
3065a	Seq. ID No. 6475	Seq. ID No. 6476
3065b	Seq. ID No. 6477	Seq. ID No. 6478
3066	Seq. ID No. 6479	Seq. ID No. 6480
3067	Seq. ID No. 6481	Seq. ID No. 6482
3068	Seq. ID No. 6483	Seq. ID No. 6484
3069	Seq. ID No. 6485	Seq. ID No. 6486
3071	Seq. ID No. 6487	Seq. ID No. 6488
3072a	Seq. ID No. 6489	Seq. ID No. 6490
3073	Seq. ID No. 6491	Seq. ID No. 6492
3075	Seq. ID No. 6495	Seq. ID No. 6496
3076	Seq. ID No. 6497	Seq. ID No. 6498
3079	Seq. ID No. 6507	Seq. ID No. 6508
3085	Seq. ID No. 6517	Seq. ID No. 6518
3086	Seq. ID No. 6519	Seq. ID No. 6520
3087a	Seq. ID No. 6521	Seq. ID No. 6522
3087c	Seq. ID No. 6523	Seq. ID No. 6524
3088	Seq. ID No. 6525	Seq. ID No. 6526
3089a	Seq. ID No. 6527	Seq. ID No. 6528
3089b	Seq. ID No. 6529	Seq. ID No. 6530
3091	Seq. ID No. 6533	Seq. ID No. 6534
3095	Seq. ID No. 6539	Seq. ID No. 6540
3096a	Seq. ID No. 6541	Seq. ID No. 6542
3096b	Seq. ID No. 6543	Seq. ID No. 6544
3100a	Seq. ID No. 6555	Seq. ID No. 6556

**TABLE 17: UNIQUE ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
3100b	Seq. ID No. 6557	Seq. ID No. 6558
3102	Seq. ID No. 6561	Seq. ID No. 6562
3103b	Seq. ID No. 6563	Seq. ID No. 6564
3104	Seq. ID No. 6565	Seq. ID No. 6566
3105	Seq. ID No. 6567	Seq. ID No. 6568
3106	Seq. ID No. 6569	Seq. ID No. 6570
3107a	Seq. ID No. 6571	Seq. ID No. 6572
3107b	Seq. ID No. 6573	Seq. ID No. 6574
3110a	Seq. ID No. 6581	Seq. ID No. 6582
3110b	Seq. ID No. 6583	Seq. ID No. 6584
3140	Seq. ID No. 6631	Seq. ID No. 6632
3145a	Seq. ID No. 6635	Seq. ID No. 6636
3145b	Seq. ID No. 6637	Seq. ID No. 6638
3145c	Seq. ID No. 6639	Seq. ID No. 6640
3147b	Seq. ID No. 6643	Seq. ID No. 6644
3147c	Seq. ID No. 6645	Seq. ID No. 6646
3149a	Seq. ID No. 6647	Seq. ID No. 6648
3150a	Seq. ID No. 6649	Seq. ID No. 6650

Listed in Table 18 are 1529 ORFs detected by the Glimmer™ ORF finder program.

5

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1	Seq. ID No. 1	Seq. ID No. 2
2b	Seq. ID No. 5	Seq. ID No. 6
4c	Seq. ID No. 11	Seq. ID No. 12
5	Seq. ID No. 13	Seq. ID No. 14
7	Seq. ID No. 15	Seq. ID No. 16

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
10	Seq. ID No. 17	Seq. ID No. 18
17	Seq. ID No. 25	Seq. ID No. 26
18	Seq. ID No. 27	Seq. ID No. 28
20	Seq. ID No. 29	Seq. ID No. 30
23b	Seq. ID No. 35	Seq. ID No. 36
24	Seq. ID No. 37	Seq. ID No. 38
36	Seq. ID No. 41	Seq. ID No. 42
37	Seq. ID No. 43	Seq. ID No. 44
38b	Seq. ID No. 47	Seq. ID No. 48
39b	Seq. ID No. 51	Seq. ID No. 52
40	Seq. ID No. 53	Seq. ID No. 54
41c	Seq. ID No. 59	Seq. ID No. 60
43c	Seq. ID No. 63	Seq. ID No. 64
45	Seq. ID No. 69	Seq. ID No. 70
46b	Seq. ID No. 73	Seq. ID No. 74
47	Seq. ID No. 75	Seq. ID No. 76
48c	Seq. ID No. 81	Seq. ID No. 82
50	Seq. ID No. 83	Seq. ID No. 84
51c	Seq. ID No. 89	Seq. ID No. 90
56b	Seq. ID No. 93	Seq. ID No. 94
57b	Seq. ID No. 97	Seq. ID No. 98
60b	Seq. ID No. 103	Seq. ID No. 104
62c	Seq. ID No. 111	Seq. ID No. 112
65c	Seq. ID No. 121	Seq. ID No. 122
67	Seq. ID No. 125	Seq. ID No. 126
71	Seq. ID No. 129	Seq. ID No. 130
74	Seq. ID No. 135	Seq. ID No. 136
77	Seq. ID No. 137	Seq. ID No. 138
80c	Seq. ID No. 145	Seq. ID No. 146

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
81b	Seq. ID No. 149	Seq. ID No. 150
85c	Seq. ID No. 157	Seq. ID No. 158
88	Seq. ID No. 167	Seq. ID No. 168
91b	Seq. ID No. 173	Seq. ID No. 174
93c	Seq. ID No. 183	Seq. ID No. 184
95b	Seq. ID No. 187	Seq. ID No. 188
97b	Seq. ID No. 189	Seq. ID No. 190
99	Seq. ID No. 191	Seq. ID No. 192
102	Seq. ID No. 195	Seq. ID No. 196
104a	Seq. ID No. 197	Seq. ID No. 198
105a	Seq. ID No. 203	Seq. ID No. 204
106	Seq. ID No. 207	Seq. ID No. 208
109d	Seq. ID No. 215	Seq. ID No. 216
111b	Seq. ID No. 219	Seq. ID No. 220
112b	Seq. ID No. 223	Seq. ID No. 224
114	Seq. ID No. 225	Seq. ID No. 226
115	Seq. ID No. 227	Seq. ID No. 228
119b	Seq. ID No. 231	Seq. ID No. 232
121	Seq. ID No. 233	Seq. ID No. 234
124c	Seq. ID No. 239	Seq. ID No. 240
125	Seq. ID No. 241	Seq. ID No. 242
127c	Seq. ID No. 247	Seq. ID No. 248
129c	Seq. ID No. 253	Seq. ID No. 254
134	Seq. ID No. 261	Seq. ID No. 262
135b	Seq. ID No. 265	Seq. ID No. 266
137b	Seq. ID No. 269	Seq. ID No. 270
138b	Seq. ID No. 273	Seq. ID No. 274
142	Seq. ID No. 275	Seq. ID No. 276
143	Seq. ID No. 277	Seq. ID No. 278

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
144c	Seq. ID No. 283	Seq. ID No. 284
145d	Seq. ID No. 291	Seq. ID No. 292
147	Seq. ID No. 293	Seq. ID No. 294
151b	Seq. ID No. 297	Seq. ID No. 298
152b	Seq. ID No. 301	Seq. ID No. 302
153c	Seq. ID No. 307	Seq. ID No. 308
154	Seq. ID No. 309	Seq. ID No. 310
155b	Seq. ID No. 313	Seq. ID No. 314
157b	Seq. ID No. 317	Seq. ID No. 318
158b	Seq. ID No. 321	Seq. ID No. 322
160b	Seq. ID No. 325	Seq. ID No. 326
162e	Seq. ID No. 335	Seq. ID No. 336
165b	Seq. ID No. 343	Seq. ID No. 344
167	Seq. ID No. 345	Seq. ID No. 346
171b	Seq. ID No. 353	Seq. ID No. 354
172	Seq. ID No. 355	Seq. ID No. 356
175	Seq. ID No. 361	Seq. ID No. 362
176	Seq. ID No. 363	Seq. ID No. 364
177b	Seq. ID No. 367	Seq. ID No. 368
180b	Seq. ID No. 375	Seq. ID No. 376
184	Seq. ID No. 379	Seq. ID No. 380
186	Seq. ID No. 383	Seq. ID No. 384
188	Seq. ID No. 389	Seq. ID No. 390
189b	Seq. ID No. 391	Seq. ID No. 392
192b	Seq. ID No. 397	Seq. ID No. 398
195	Seq. ID No. 405	Seq. ID No. 406
197b	Seq. ID No. 411	Seq. ID No. 412
198b	Seq. ID No. 415	Seq. ID No. 416
200	Seq. ID No. 417	Seq. ID No. 418



**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
203	Seq. ID No. 423	Seq. ID No. 424
204	Seq. ID No. 425	Seq. ID No. 426
205	Seq. ID No. 427	Seq. ID No. 428
206	Seq. ID No. 429	Seq. ID No. 430
208b	Seq. ID No. 435	Seq. ID No. 436
210	Seq. ID No. 437	Seq. ID No. 438
211	Seq. ID No. 439	Seq. ID No. 440
213	Seq. ID No. 441	Seq. ID No. 442
218	Seq. ID No. 445	Seq. ID No. 446
219	Seq. ID No. 447	Seq. ID No. 448
220c	Seq. ID No. 453	Seq. ID No. 454
226b	Seq. ID No. 461	Seq. ID No. 462
227	Seq. ID No. 463	Seq. ID No. 464
228d	Seq. ID No. 471	Seq. ID No. 472
236c	Seq. ID No. 485	Seq. ID No. 486
245c	Seq. ID No. 501	Seq. ID No. 502
246b	Seq. ID No. 505	Seq. ID No. 506
248b	Seq. ID No. 511	Seq. ID No. 512
249b	Seq. ID No. 515	Seq. ID No. 516
251	Seq. ID No. 517	Seq. ID No. 518
253b	Seq. ID No. 521	Seq. ID No. 522
254	Seq. ID No. 523	Seq. ID No. 524
255d	Seq. ID No. 531	Seq. ID No. 532
258	Seq. ID No. 533	Seq. ID No. 534
259c	Seq. ID No. 539	Seq. ID No. 540
260	Seq. ID No. 541	Seq. ID No. 542
262	Seq. ID No. 543	Seq. ID No. 544
265	Seq. ID No. 551	Seq. ID No. 552
267c	Seq. ID No. 555	Seq. ID No. 556

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
269b	Seq. ID No. 561	Seq. ID No. 562
271b	Seq. ID No. 565	Seq. ID No. 566
273b	Seq. ID No. 569	Seq. ID No. 570
277c	Seq. ID No. 575	Seq. ID No. 576
279b	Seq. ID No. 579	Seq. ID No. 580
280d	Seq. ID No. 587	Seq. ID No. 588
283b	Seq. ID No. 593	Seq. ID No. 594
284b	Seq. ID No. 597	Seq. ID No. 598
286b	Seq. ID No. 603	Seq. ID No. 604
287	Seq. ID No. 605	Seq. ID No. 606
290b	Seq. ID No. 609	Seq. ID No. 610
293	Seq. ID No. 611	Seq. ID No. 612
294	Seq. ID No. 613	Seq. ID No. 614
296	Seq. ID No. 615	Seq. ID No. 616
301b	Seq. ID No. 623	Seq. ID No. 624
304b	Seq. ID No. 627	Seq. ID No. 628
307	Seq. ID No. 629	Seq. ID No. 630
308	Seq. ID No. 631	Seq. ID No. 632
310	Seq. ID No. 635	Seq. ID No. 636
311	Seq. ID No. 637	Seq. ID No. 638
313e	Seq. ID No. 647	Seq. ID No. 648
315	Seq. ID No. 649	Seq. ID No. 650
318c	Seq. ID No. 661	Seq. ID No. 662
321	Seq. ID No. 669	Seq. ID No. 670
323b	Seq. ID No. 673	Seq. ID No. 674
324	Seq. ID No. 675	Seq. ID No. 676
327c	Seq. ID No. 681	Seq. ID No. 682
329	Seq. ID No. 683	Seq. ID No. 684
330c	Seq. ID No. 689	Seq. ID No. 690

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
335b	Seq. ID No. 701	Seq. ID No. 702
337	Seq. ID No. 703	Seq. ID No. 704
338c	Seq. ID No. 709	Seq. ID No. 710
341b	Seq. ID No. 713	Seq. ID No. 714
342h	Seq. ID No. 729	Seq. ID No. 730
344b	Seq. ID No. 733	Seq. ID No. 734
345	Seq. ID No. 735	Seq. ID No. 736
346a	Seq. ID No. 737	Seq. ID No. 738
347	Seq. ID No. 741	Seq. ID No. 742
349c	Seq. ID No. 747	Seq. ID No. 748
350b	Seq. ID No. 751	Seq. ID No. 752
351	Seq. ID No. 753	Seq. ID No. 754
352c	Seq. ID No. 759	Seq. ID No. 760
354c	Seq. ID No. 765	Seq. ID No. 766
355	Seq. ID No. 767	Seq. ID No. 768
356b	Seq. ID No. 771	Seq. ID No. 772
358c	Seq. ID No. 781	Seq. ID No. 782
362	Seq. ID No. 783	Seq. ID No. 784
365b	Seq. ID No. 787	Seq. ID No. 788
366c	Seq. ID No. 791	Seq. ID No. 792
367b	Seq. ID No. 795	Seq. ID No. 796
371b	Seq. ID No. 799	Seq. ID No. 800
372d	Seq. ID No. 807	Seq. ID No. 808
378b	Seq. ID No. 817	Seq. ID No. 818
382b	Seq. ID No. 819	Seq. ID No. 820
383b	Seq. ID No. 823	Seq. ID No. 824
384b	Seq. ID No. 827	Seq. ID No. 828
385b	Seq. ID No. 831	Seq. ID No. 832
387	Seq. ID No. 835	Seq. ID No. 836

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
390	Seq. ID No. 837	Seq. ID No. 838
391	Seq. ID No. 839	Seq. ID No. 840
395c	Seq. ID No. 847	Seq. ID No. 848
398	Seq. ID No. 851	Seq. ID No. 852
400b	Seq. ID No. 855	Seq. ID No. 856
401b	Seq. ID No. 859	Seq. ID No. 860
403d	Seq. ID No. 867	Seq. ID No. 868
406b	Seq. ID No. 871	Seq. ID No. 872
409b	Seq. ID No. 875	Seq. ID No. 876
410c	Seq. ID No. 881	Seq. ID No. 882
413b	Seq. ID No. 885	Seq. ID No. 886
416b	Seq. ID No. 889	Seq. ID No. 890
417	Seq. ID No. 891	Seq. ID No. 892
418b	Seq. ID No. 895	Seq. ID No. 896
419c	Seq. ID No. 901	Seq. ID No. 902
421	Seq. ID No. 907	Seq. ID No. 908
424c	Seq. ID No. 915	Seq. ID No. 916
426b	Seq. ID No. 919	Seq. ID No. 920
427c	Seq. ID No. 925	Seq. ID No. 926
429b	Seq. ID No. 929	Seq. ID No. 930
431	Seq. ID No. 935	Seq. ID No. 936
435	Seq. ID No. 939	Seq. ID No. 940
438c	Seq. ID No. 949	Seq. ID No. 950
440	Seq. ID No. 951	Seq. ID No. 952
441b	Seq. ID No. 955	Seq. ID No. 956
444b	Seq. ID No. 961	Seq. ID No. 962
445b	Seq. ID No. 965	Seq. ID No. 966
448	Seq. ID No. 967	Seq. ID No. 968
450b	Seq. ID No. 971	Seq. ID No. 972

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
452e	Seq. ID No. 985	Seq. ID No. 986
455c	Seq. ID No. 993	Seq. ID No. 994
458b	Seq. ID No. 997	Seq. ID No. 998
460c	Seq. ID No. 1003	Seq. ID No. 1004
462	Seq. ID No. 1005	Seq. ID No. 1006
463b	Seq. ID No. 1009	Seq. ID No. 1010
464d	Seq. ID No. 1017	Seq. ID No. 1018
467b	Seq. ID No. 1023	Seq. ID No. 1024
472f	Seq. ID No. 1039	Seq. ID No. 1040
473	Seq. ID No. 1041	Seq. ID No. 1042
474	Seq. ID No. 1043	Seq. ID No. 1044
478b	Seq. ID No. 1051	Seq. ID No. 1052
479	Seq. ID No. 1053	Seq. ID No. 1054
480b	Seq. ID No. 1057	Seq. ID No. 1058
481b	Seq. ID No. 1061	Seq. ID No. 1062
482b	Seq. ID No. 1065	Seq. ID No. 1066
483	Seq. ID No. 1067	Seq. ID No. 1068
490	Seq. ID No. 1069	Seq. ID No. 1070
491b	Seq. ID No. 1073	Seq. ID No. 1074
492	Seq. ID No. 1075	Seq. ID No. 1076
495c	Seq. ID No. 1083	Seq. ID No. 1084
498b	Seq. ID No. 1087	Seq. ID No. 1088
499b	Seq. ID No. 1091	Seq. ID No. 1092
500	Seq. ID No. 1093	Seq. ID No. 1094
502c	Seq. ID No. 1097	Seq. ID No. 1098
504	Seq. ID No. 1099	Seq. ID No. 1100
505b	Seq. ID No. 1103	Seq. ID No. 1104
509	Seq. ID No. 1109	Seq. ID No. 1110
512b	Seq. ID No. 1115	Seq. ID No. 1116

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
514	Seq. ID No. 1117	Seq. ID No. 1118
515c	Seq. ID No. 1123	Seq. ID No. 1124
518c	Seq. ID No. 1129	Seq. ID No. 1130
523	Seq. ID No. 1133	Seq. ID No. 1134
524b	Seq. ID No. 1137	Seq. ID No. 1138
527b	Seq. ID No. 1143	Seq. ID No. 1144
528b	Seq. ID No. 1147	Seq. ID No. 1148
529	Seq. ID No. 1149	Seq. ID No. 1150
533	Seq. ID No. 1155	Seq. ID No. 1156
535	Seq. ID No. 1157	Seq. ID No. 1158
536	Seq. ID No. 1159	Seq. ID No. 1160
539c	Seq. ID No. 1163	Seq. ID No. 1164
541d	Seq. ID No. 1171	Seq. ID No. 1172
543c	Seq. ID No. 1179	Seq. ID No. 1180
544	Seq. ID No. 1181	Seq. ID No. 1182
545c	Seq. ID No. 1187	Seq. ID No. 1188
546c	Seq. ID No. 1193	Seq. ID No. 1194
548	Seq. ID No. 1199	Seq. ID No. 1200
551	Seq. ID No. 1205	Seq. ID No. 1206
554b	Seq. ID No. 1211	Seq. ID No. 1212
557b	Seq. ID No. 1217	Seq. ID No. 1218
560b	Seq. ID No. 1221	Seq. ID No. 1222
561	Seq. ID No. 1223	Seq. ID No. 1224
563	Seq. ID No. 1225	Seq. ID No. 1226
564c	Seq. ID No. 1231	Seq. ID No. 1232
569	Seq. ID No. 1233	Seq. ID No. 1234
570b	Seq. ID No. 1237	Seq. ID No. 1238
573	Seq. ID No. 1241	Seq. ID No. 1242
580b	Seq. ID No. 1253	Seq. ID No. 1254

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
583b	Seq. ID No. 1257	Seq. ID No. 1258
586b	Seq. ID No. 1263	Seq. ID No. 1264
587d	Seq. ID No. 1271	Seq. ID No. 1272
590	Seq. ID No. 1281	Seq. ID No. 1282
609b	Seq. ID No. 1317	Seq. ID No. 1318
611	Seq. ID No. 1323	Seq. ID No. 1324
613d	Seq. ID No. 1331	Seq. ID No. 1332
614b	Seq. ID No. 1335	Seq. ID No. 1336
618	Seq. ID No. 1339	Seq. ID No. 1340
620	Seq. ID No. 1345	Seq. ID No. 1346
623	Seq. ID No. 1347	Seq. ID No. 1348
626c	Seq. ID No. 1361	Seq. ID No. 1362
631d	Seq. ID No. 1369	Seq. ID No. 1370
633c	Seq. ID No. 1377	Seq. ID No. 1378
634b	Seq. ID No. 1379	Seq. ID No. 1380
637c	Seq. ID No. 1387	Seq. ID No. 1388
641b	Seq. ID No. 1393	Seq. ID No. 1394
643	Seq. ID No. 1395	Seq. ID No. 1396
644b	Seq. ID No. 1399	Seq. ID No. 1400
650	Seq. ID No. 1403	Seq. ID No. 1404
652	Seq. ID No. 1405	Seq. ID No. 1406
653c	Seq. ID No. 1411	Seq. ID No. 1412
656	Seq. ID No. 1413	Seq. ID No. 1414
657c	Seq. ID No. 1415	Seq. ID No. 1416
658b	Seq. ID No. 1419	Seq. ID No. 1420
661	Seq. ID No. 1425	Seq. ID No. 1426
663	Seq. ID No. 1427	Seq. ID No. 1428
665	Seq. ID No. 1429	Seq. ID No. 1430
666	Seq. ID No. 1431	Seq. ID No. 1432

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
670	Seq. ID No. 1433	Seq. ID No. 1434
674b	Seq. ID No. 1437	Seq. ID No. 1438
677b	Seq. ID No. 1443	Seq. ID No. 1444
680	Seq. ID No. 1449	Seq. ID No. 1450
681	Seq. ID No. 1451	Seq. ID No. 1452
683b	Seq. ID No. 1455	Seq. ID No. 1456
684	Seq. ID No. 1457	Seq. ID No. 1458
687	Seq. ID No. 1459	Seq. ID No. 1460
688b	Seq. ID No. 1463	Seq. ID No. 1464
690	Seq. ID No. 1465	Seq. ID No. 1466
691b	Seq. ID No. 1469	Seq. ID No. 1470
692	Seq. ID No. 1471	Seq. ID No. 1472
694	Seq. ID No. 1473	Seq. ID No. 1474
696	Seq. ID No. 1475	Seq. ID No. 1476
698	Seq. ID No. 1477	Seq. ID No. 1478
700c	Seq. ID No. 1485	Seq. ID No. 1486
703	Seq. ID No. 1487	Seq. ID No. 1488
705b	Seq. ID No. 1491	Seq. ID No. 1492
707	Seq. ID No. 1493	Seq. ID No. 1494
709	Seq. ID No. 1495	Seq. ID No. 1496
710	Seq. ID No. 1497	Seq. ID No. 1498
712b	Seq. ID No. 1501	Seq. ID No. 1502
715b	Seq. ID No. 1505	Seq. ID No. 1506
717	Seq. ID No. 1507	Seq. ID No. 1508
718a	Seq. ID No. 1509	Seq. ID No. 1510
722c	Seq. ID No. 1517	Seq. ID No. 1518
724d	Seq. ID No. 1525	Seq. ID No. 1526
726	Seq. ID No. 1527	Seq. ID No. 1528
728b	Seq. ID No. 1531	Seq. ID No. 1532



**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
730d	Seq. ID No. 1539	Seq. ID No. 1540
731b	Seq. ID No. 1541	Seq. ID No. 1542
732	Seq. ID No. 1543	Seq. ID No. 1544
738c	Seq. ID No. 1549	Seq. ID No. 1550
743b	Seq. ID No. 1561	Seq. ID No. 1562
744	Seq. ID No. 1563	Seq. ID No. 1564
745b	Seq. ID No. 1567	Seq. ID No. 1568
746b	Seq. ID No. 1571	Seq. ID No. 1572
747	Seq. ID No. 1573	Seq. ID No. 1574
748b	Seq. ID No. 1577	Seq. ID No. 1578
751	Seq. ID No. 1581	Seq. ID No. 1582
754d	Seq. ID No. 1589	Seq. ID No. 1590
756b	Seq. ID No. 1593	Seq. ID No. 1594
758	Seq. ID No. 1595	Seq. ID No. 1596
760	Seq. ID No. 1597	Seq. ID No. 1598
762c	Seq. ID No. 1603	Seq. ID No. 1604
763b	Seq. ID No. 1607	Seq. ID No. 1608
766	Seq. ID No. 1611	Seq. ID No. 1612
767	Seq. ID No. 1613	Seq. ID No. 1614
770c	Seq. ID No. 1619	Seq. ID No. 1620
772b	Seq. ID No. 1623	Seq. ID No. 1624
775	Seq. ID No. 1627	Seq. ID No. 1628
777c	Seq. ID No. 1631	Seq. ID No. 1632
780b	Seq. ID No. 1637	Seq. ID No. 1638
782b	Seq. ID No. 1639	Seq. ID No. 1640
785	Seq. ID No. 1641	Seq. ID No. 1642
788b	Seq. ID No. 1647	Seq. ID No. 1648
789c	Seq. ID No. 1653	Seq. ID No. 1654
792	Seq. ID No. 1657	Seq. ID No. 1658

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
794d	Seq. ID No. 1665	Seq. ID No. 1666
797	Seq. ID No. 1669	Seq. ID No. 1670
799f	Seq. ID No. 1681	Seq. ID No. 1682
803b	Seq. ID No. 1685	Seq. ID No. 1686
804b	Seq. ID No. 1689	Seq. ID No. 1690
807	Seq. ID No. 1691	Seq. ID No. 1692
812	Seq. ID No. 1697	Seq. ID No. 1698
813	Seq. ID No. 1699	Seq. ID No. 1700
826	Seq. ID No. 1707	Seq. ID No. 1708
829b	Seq. ID No. 1711	Seq. ID No. 1712
830	Seq. ID No. 1713	Seq. ID No. 1714
834c	Seq. ID No. 1719	Seq. ID No. 1720
835b	Seq. ID No. 1723	Seq. ID No. 1724
836c	Seq. ID No. 1729	Seq. ID No. 1730
837c	Seq. ID No. 1735	Seq. ID No. 1736
843	Seq. ID No. 1737	Seq. ID No. 1738
847b	Seq. ID No. 1741	Seq. ID No. 1742
849b	Seq. ID No. 1747	Seq. ID No. 1748
851b	Seq. ID No. 1751	Seq. ID No. 1752
853c	Seq. ID No. 1757	Seq. ID No. 1758
854	Seq. ID No. 1759	Seq. ID No. 1760
855	Seq. ID No. 1761	Seq. ID No. 1762
859d	Seq. ID No. 1771	Seq. ID No. 1772
863	Seq. ID No. 1777	Seq. ID No. 1778
866b	Seq. ID No. 1785	Seq. ID No. 1786
868b	Seq. ID No. 1789	Seq. ID No. 1790
870	Seq. ID No. 1791	Seq. ID No. 1792
873c	Seq. ID No. 1797	Seq. ID No. 1798
874b	Seq. ID No. 1801	Seq. ID No. 1802

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
875	Seq. ID No. 1803	Seq. ID No. 1804
876	Seq. ID No. 1805	Seq. ID No. 1806
878c	Seq. ID No. 1811	Seq. ID No. 1812
880c	Seq. ID No. 1817	Seq. ID No. 1818
885	Seq. ID No. 1819	Seq. ID No. 1820
886	Seq. ID No. 1821	Seq. ID No. 1822
888	Seq. ID No. 1825	Seq. ID No. 1826
890b	Seq. ID No. 1829	Seq. ID No. 1830
907b	Seq. ID No. 1837	Seq. ID No. 1838
908c	Seq. ID No. 1843	Seq. ID No. 1844
911	Seq. ID No. 1845	Seq. ID No. 1846
912	Seq. ID No. 1847	Seq. ID No. 1848
916	Seq. ID No. 1849	Seq. ID No. 1850
917	Seq. ID No. 1851	Seq. ID No. 1852
918c	Seq. ID No. 1855	Seq. ID No. 1856
923	Seq. ID No. 1859	Seq. ID No. 1860
925b	Seq. ID No. 1863	Seq. ID No. 1864
926	Seq. ID No. 1865	Seq. ID No. 1866
927	Seq. ID No. 1867	Seq. ID No. 1868
929b	Seq. ID No. 1871	Seq. ID No. 1872
930	Seq. ID No. 1873	Seq. ID No. 1874
932	Seq. ID No. 1877	Seq. ID No. 1878
934d	Seq. ID No. 1885	Seq. ID No. 1886
935	Seq. ID No. 1887	Seq. ID No. 1888
938	Seq. ID No. 1889	Seq. ID No. 1890
939c	Seq. ID No. 1895	Seq. ID No. 1896
942	Seq. ID No. 1897	Seq. ID No. 1898
943	Seq. ID No. 1899	Seq. ID No. 1900
944b	Seq. ID No. 1903	Seq. ID No. 1904

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
946	Seq. ID No. 1905	Seq. ID No. 1906
949d	Seq. ID No. 1913	Seq. ID No. 1914
951b	Seq. ID No. 1919	Seq. ID No. 1920
952b	Seq. ID No. 1923	Seq. ID No. 1924
954	Seq. ID No. 1925	Seq. ID No. 1926
956	Seq. ID No. 1931	Seq. ID No. 1932
958b	Seq. ID No. 1935	Seq. ID No. 1936
959	Seq. ID No. 1937	Seq. ID No. 1938
961c	Seq. ID No. 1943	Seq. ID No. 1944
963	Seq. ID No. 1945	Seq. ID No. 1946
965b	Seq. ID No. 1949	Seq. ID No. 1950
966b	Seq. ID No. 1953	Seq. ID No. 1954
967b	Seq. ID No. 1957	Seq. ID No. 1958
968	Seq. ID No. 1959	Seq. ID No. 1960
969	Seq. ID No. 1961	Seq. ID No. 1962
972b	Seq. ID No. 1965	Seq. ID No. 1966
976	Seq. ID No. 1967	Seq. ID No. 1968
977b	Seq. ID No. 1971	Seq. ID No. 1972
978b	Seq. ID No. 1975	Seq. ID No. 1976
980	Seq. ID No. 1979	Seq. ID No. 1980
982	Seq. ID No. 1983	Seq. ID No. 1984
984b	Seq. ID No. 1987	Seq. ID No. 1988
986	Seq. ID No. 1989	Seq. ID No. 1990
987	Seq. ID No. 1991	Seq. ID No. 1992
988d	Seq. ID No. 1999	Seq. ID No. 2000
991	Seq. ID No. 2001	Seq. ID No. 2002
992	Seq. ID No. 2003	Seq. ID No. 2004
995	Seq. ID No. 2009	Seq. ID No. 2010
998b	Seq. ID No. 2015	Seq. ID No. 2016

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
999b	Seq. ID No. 2019	Seq. ID No. 2020
1000	Seq. ID No. 2021	Seq. ID No. 2022
1004b	Seq. ID No. 2031	Seq. ID No. 2032
1006b	Seq. ID No. 2035	Seq. ID No. 2036
1007	Seq. ID No. 2037	Seq. ID No. 2038
1013c	Seq. ID No. 2045	Seq. ID No. 2046
1016c	Seq. ID No. 2047	Seq. ID No. 2048
1017d	Seq. ID No. 2055	Seq. ID No. 2056
1018b	Seq. ID No. 2059	Seq. ID No. 2060
1021c	Seq. ID No. 2065	Seq. ID No. 2066
1024	Seq. ID No. 2067	Seq. ID No. 2068
1025	Seq. ID No. 2069	Seq. ID No. 2070
1026	Seq. ID No. 2071	Seq. ID No. 2072
1029	Seq. ID No. 2073	Seq. ID No. 2074
1033c	Seq. ID No. 2079	Seq. ID No. 2080
1036c	Seq. ID No. 2091	Seq. ID No. 2092
1037	Seq. ID No. 2093	Seq. ID No. 2094
1039b	Seq. ID No. 2097	Seq. ID No. 2098
1041	Seq. ID No. 2099	Seq. ID No. 2100
1042b	Seq. ID No. 2103	Seq. ID No. 2104
1047b	Seq. ID No. 2115	Seq. ID No. 2116
1049b	Seq. ID No. 2119	Seq. ID No. 2120
1050d	Seq. ID No. 2127	Seq. ID No. 2128
1057	Seq. ID No. 2135	Seq. ID No. 2136
1058	Seq. ID No. 2137	Seq. ID No. 2138
1060b	Seq. ID No. 2141	Seq. ID No. 2142
1062	Seq. ID No. 2143	Seq. ID No. 2144
1064	Seq. ID No. 2147	Seq. ID No. 2148
1065c	Seq. ID No. 2153	Seq. ID No. 2154

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1067	Seq. ID No. 2159	Seq. ID No. 2160
1069	Seq. ID No. 2161	Seq. ID No. 2162
1070b	Seq. ID No. 2165	Seq. ID No. 2166
1076b	Seq. ID No. 2169	Seq. ID No. 2170
1077e	Seq. ID No. 2179	Seq. ID No. 2180
1079b	Seq. ID No. 2183	Seq. ID No. 2184
1080a	Seq. ID No. 2185	Seq. ID No. 2186
1081b	Seq. ID No. 2189	Seq. ID No. 2190
1082	Seq. ID No. 2191	Seq. ID No. 2192
1085	Seq. ID No. 2193	Seq. ID No. 2194
1086	Seq. ID No. 2195	Seq. ID No. 2196
1087b	Seq. ID No. 2199	Seq. ID No. 2200
1094b	Seq. ID No. 2207	Seq. ID No. 2208
1096c	Seq. ID No. 2217	Seq. ID No. 2218
1097	Seq. ID No. 2219	Seq. ID No. 2220
1098b	Seq. ID No. 2221	Seq. ID No. 2222
1100	Seq. ID No. 2223	Seq. ID No. 2224
1101b	Seq. ID No. 2227	Seq. ID No. 2228
1104	Seq. ID No. 2229	Seq. ID No. 2230
1106	Seq. ID No. 2231	Seq. ID No. 2232
1108a	Seq. ID No. 2233	Seq. ID No. 2234
1111c	Seq. ID No. 2241	Seq. ID No. 2242
1125	Seq. ID No. 2245	Seq. ID No. 2246
1126c	Seq. ID No. 2251	Seq. ID No. 2252
1127	Seq. ID No. 2253	Seq. ID No. 2254
1131	Seq. ID No. 2257	Seq. ID No. 2258
1132	Seq. ID No. 2259	Seq. ID No. 2260
1135b	Seq. ID No. 2263	Seq. ID No. 2264
1136b	Seq. ID No. 2267	Seq. ID No. 2268

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1138	Seq. ID No. 2269	Seq. ID No. 2270
1140c	Seq. ID No. 2275	Seq. ID No. 2276
1142	Seq. ID No. 2281	Seq. ID No. 2282
1144c	Seq. ID No. 2287	Seq. ID No. 2288
1146e	Seq. ID No. 2297	Seq. ID No. 2298
1148	Seq. ID No. 2299	Seq. ID No. 2300
1149	Seq. ID No. 2301	Seq. ID No. 2302
1152g	Seq. ID No. 2315	Seq. ID No. 2316
1155g	Seq. ID No. 2329	Seq. ID No. 2330
1158b	Seq. ID No. 2333	Seq. ID No. 2334
1160	Seq. ID No. 2335	Seq. ID No. 2336
1161b	Seq. ID No. 2339	Seq. ID No. 2340
1165	Seq. ID No. 2343	Seq. ID No. 2344
1166	Seq. ID No. 2345	Seq. ID No. 2346
1167b	Seq. ID No. 2349	Seq. ID No. 2350
1168	Seq. ID No. 2351	Seq. ID No. 2352
1169c	Seq. ID No. 2357	Seq. ID No. 2358
1170	Seq. ID No. 2359	Seq. ID No. 2360
1171c	Seq. ID No. 2363	Seq. ID No. 2364
1172	Seq. ID No. 2365	Seq. ID No. 2366
1174	Seq. ID No. 2369	Seq. ID No. 2370
1177	Seq. ID No. 2373	Seq. ID No. 2374
1179c	Seq. ID No. 2381	Seq. ID No. 2382
1180e	Seq. ID No. 2391	Seq. ID No. 2392
1183b	Seq. ID No. 2399	Seq. ID No. 2400
1184	Seq. ID No. 2401	Seq. ID No. 2402
1185b	Seq. ID No. 2405	Seq. ID No. 2406
1186b	Seq. ID No. 2409	Seq. ID No. 2410
1188c	Seq. ID No. 2415	Seq. ID No. 2416

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1191	Seq. ID No. 2417	Seq. ID No. 2418
1192b	Seq. ID No. 2421	Seq. ID No. 2422
1194	Seq. ID No. 2423	Seq. ID No. 2424
1196b	Seq. ID No. 2427	Seq. ID No. 2428
1197	Seq. ID No. 2429	Seq. ID No. 2430
1198	Seq. ID No. 2431	Seq. ID No. 2432
1199b	Seq. ID No. 2435	Seq. ID No. 2436
1200	Seq. ID No. 2437	Seq. ID No. 2438
1201	Seq. ID No. 2439	Seq. ID No. 2440
1202b	Seq. ID No. 2443	Seq. ID No. 2444
1205	Seq. ID No. 2445	Seq. ID No. 2446
1207	Seq. ID No. 2449	Seq. ID No. 2450
1208	Seq. ID No. 2451	Seq. ID No. 2452
1209	Seq. ID No. 2453	Seq. ID No. 2454
1210b	Seq. ID No. 2457	Seq. ID No. 2458
1213b	Seq. ID No. 2463	Seq. ID No. 2464
1214	Seq. ID No. 2465	Seq. ID No. 2466
1215b	Seq. ID No. 2469	Seq. ID No. 2470
1217c	Seq. ID No. 2471	Seq. ID No. 2472
1218b	Seq. ID No. 2475	Seq. ID No. 2476
1219	Seq. ID No. 2477	Seq. ID No. 2478
1221b	Seq. ID No. 2483	Seq. ID No. 2484
1223	Seq. ID No. 2485	Seq. ID No. 2486
1224c	Seq. ID No. 2491	Seq. ID No. 2492
1226	Seq. ID No. 2495	Seq. ID No. 2496
1230	Seq. ID No. 2505	Seq. ID No. 2506
1231	Seq. ID No. 2507	Seq. ID No. 2508
1233c	Seq. ID No. 2513	Seq. ID No. 2514
1234c	Seq. ID No. 2519	Seq. ID No. 2520



TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1237	Seq. ID No. 2525	Seq. ID No. 2526
1240	Seq. ID No. 2529	Seq. ID No. 2530
1241c	Seq. ID No. 2535	Seq. ID No. 2536
1243	Seq. ID No. 2537	Seq. ID No. 2538
1244	Seq. ID No. 2539	Seq. ID No. 2540
1245e	Seq. ID No. 2549	Seq. ID No. 2550
1246b	Seq. ID No. 2553	Seq. ID No. 2554
1250e	Seq. ID No. 2563	Seq. ID No. 2564
1251b	Seq. ID No. 2567	Seq. ID No. 2568
1253d	Seq. ID No. 2575	Seq. ID No. 2576
1256	Seq. ID No. 2577	Seq. ID No. 2578
1257b	Seq. ID No. 2581	Seq. ID No. 2582
1258d	Seq. ID No. 2589	Seq. ID No. 2590
1263	Seq. ID No. 2593	Seq. ID No. 2594
1265	Seq. ID No. 2595	Seq. ID No. 2596
1266b	Seq. ID No. 2599	Seq. ID No. 2600
1267b	Seq. ID No. 2603	Seq. ID No. 2604
1268b	Seq. ID No. 2607	Seq. ID No. 2608
1269	Seq. ID No. 2609	Seq. ID No. 2610
1271	Seq. ID No. 2613	Seq. ID No. 2614
1272b	Seq. ID No. 2617	Seq. ID No. 2618
1273	Seq. ID No. 2619	Seq. ID No. 2620
1275b	Seq. ID No. 2623	Seq. ID No. 2624
1277	Seq. ID No. 2625	Seq. ID No. 2626
1279	Seq. ID No. 2631	Seq. ID No. 2632
1281	Seq. ID No. 2633	Seq. ID No. 2634
1283c	Seq. ID No. 2639	Seq. ID No. 2640
1284	Seq. ID No. 2641	Seq. ID No. 2642
1285b	Seq. ID No. 2645	Seq. ID No. 2646

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1287b	Seq. ID No. 2649	Seq. ID No. 2650
1288	Seq. ID No. 2651	Seq. ID No. 2652
1290	Seq. ID No. 2655	Seq. ID No. 2656
1293b	Seq. ID No. 2659	Seq. ID No. 2660
1295	Seq. ID No. 2663	Seq. ID No. 2664
1297b	Seq. ID No. 2667	Seq. ID No. 2668
1300	Seq. ID No. 2669	Seq. ID No. 2670
1302	Seq. ID No. 2671	Seq. ID No. 2672
1305c	Seq. ID No. 2677	Seq. ID No. 2678
1308e	Seq. ID No. 2687	Seq. ID No. 2688
1311	Seq. ID No. 2689	Seq. ID No. 2690
1315	Seq. ID No. 2693	Seq. ID No. 2694
1318	Seq. ID No. 2699	Seq. ID No. 2700
1319b	Seq. ID No. 2703	Seq. ID No. 2704
1320c	Seq. ID No. 2709	Seq. ID No. 2710
1321	Seq. ID No. 2711	Seq. ID No. 2712
1322b	Seq. ID No. 2715	Seq. ID No. 2716
1324	Seq. ID No. 2719	Seq. ID No. 2720
1326c	Seq. ID No. 2725	Seq. ID No. 2726
1333	Seq. ID No. 2727	Seq. ID No. 2728
1337	Seq. ID No. 2737	Seq. ID No. 2738
1340b	Seq. ID No. 2743	Seq. ID No. 2744
1341c	Seq. ID No. 2747	Seq. ID No. 2748
1344b	Seq. ID No. 2751	Seq. ID No. 2752
1348	Seq. ID No. 2753	Seq. ID No. 2754
1349c	Seq. ID No. 2759	Seq. ID No. 2760
1350b	Seq. ID No. 2763	Seq. ID No. 2764
1353	Seq. ID No. 2765	Seq. ID No. 2766
1355	Seq. ID No. 2767	Seq. ID No. 2768

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1358b	Seq. ID No. 2771	Seq. ID No. 2772
1359	Seq. ID No. 2773	Seq. ID No. 2774
1361	Seq. ID No. 2775	Seq. ID No. 2776
1364c	Seq. ID No. 2781	Seq. ID No. 2782
1366b	Seq. ID No. 2787	Seq. ID No. 2788
1367	Seq. ID No. 2789	Seq. ID No. 2790
1368	Seq. ID No. 2791	Seq. ID No. 2792
1371	Seq. ID No. 2793	Seq. ID No. 2794
1373b	Seq. ID No. 2797	Seq. ID No. 2798
1374	Seq. ID No. 2799	Seq. ID No. 2800
1377	Seq. ID No. 2803	Seq. ID No. 2804
1378	Seq. ID No. 2805	Seq. ID No. 2806
1381a	Seq. ID No. 2811	Seq. ID No. 2812
1382	Seq. ID No. 2815	Seq. ID No. 2816
1384c	Seq. ID No. 2823	Seq. ID No. 2824
1386b	Seq. ID No. 2827	Seq. ID No. 2828
1394	Seq. ID No. 2843	Seq. ID No. 2844
1396	Seq. ID No. 2847	Seq. ID No. 2848
1405	Seq. ID No. 2863	Seq. ID No. 2864
1408	Seq. ID No. 2867	Seq. ID No. 2868
1409	Seq. ID No. 2869	Seq. ID No. 2870
1410	Seq. ID No. 2871	Seq. ID No. 2872
1411c	Seq. ID No. 2877	Seq. ID No. 2878
1412b	Seq. ID No. 2881	Seq. ID No. 2882
1416	Seq. ID No. 2891	Seq. ID No. 2892
1420b	Seq. ID No. 2899	Seq. ID No. 2900
1422	Seq. ID No. 2901	Seq. ID No. 2902
1423	Seq. ID No. 2903	Seq. ID No. 2904
1426b	Seq. ID No. 2907	Seq. ID No. 2908

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1427b	Seq. ID No. 2911	Seq. ID No. 2912
1428	Seq. ID No. 2913	Seq. ID No. 2914
1429b	Seq. ID No. 2917	Seq. ID No. 2918
1431	Seq. ID No. 2919	Seq. ID No. 2920
1432	Seq. ID No. 2921	Seq. ID No. 2922
1433	Seq. ID No. 2923	Seq. ID No. 2924
1434b	Seq. ID No. 2927	Seq. ID No. 2928
1437c	Seq. ID No. 2933	Seq. ID No. 2934
1439e	Seq. ID No. 2945	Seq. ID No. 2946
1440d	Seq. ID No. 2953	Seq. ID No. 2954
1442b	Seq. ID No. 2957	Seq. ID No. 2958
1445c	Seq. ID No. 2963	Seq. ID No. 2964
1447b	Seq. ID No. 2971	Seq. ID No. 2972
1448	Seq. ID No. 2973	Seq. ID No. 2974
1449b	Seq. ID No. 2977	Seq. ID No. 2978
1451	Seq. ID No. 2979	Seq. ID No. 2980
1452b	Seq. ID No. 2983	Seq. ID No. 2984
1453	Seq. ID No. 2985	Seq. ID No. 2986
1455b	Seq. ID No. 2991	Seq. ID No. 2992
1456	Seq. ID No. 2993	Seq. ID No. 2994
1457c	Seq. ID No. 2999	Seq. ID No. 3000
1459	Seq. ID No. 3001	Seq. ID No. 3002
1462b	Seq. ID No. 3005	Seq. ID No. 3006
1463c	Seq. ID No. 3011	Seq. ID No. 3012
1466d	Seq. ID No. 3019	Seq. ID No. 3020
1469c	Seq. ID No. 3027	Seq. ID No. 3028
1470c	Seq. ID No. 3033	Seq. ID No. 3034
1471	Seq. ID No. 3035	Seq. ID No. 3036
1472c	Seq. ID No. 3039	Seq. ID No. 3040

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1475	Seq. ID No. 3043	Seq. ID No. 3044
1476	Seq. ID No. 3045	Seq. ID No. 3046
1477b	Seq. ID No. 3049	Seq. ID No. 3050
1479c	Seq. ID No. 3055	Seq. ID No. 3056
1482b	Seq. ID No. 3059	Seq. ID No. 3060
1483	Seq. ID No. 3061	Seq. ID No. 3062
1484c	Seq. ID No. 3067	Seq. ID No. 3068
1486	Seq. ID No. 3069	Seq. ID No. 3070
1488e	Seq. ID No. 3081	Seq. ID No. 3082
1490	Seq. ID No. 3089	Seq. ID No. 3090
1494	Seq. ID No. 3091	Seq. ID No. 3092
1497	Seq. ID No. 3093	Seq. ID No. 3094
1498b	Seq. ID No. 3097	Seq. ID No. 3098
1499	Seq. ID No. 3103	Seq. ID No. 3104
1502b	Seq. ID No. 3107	Seq. ID No. 3108
1503b	Seq. ID No. 3111	Seq. ID No. 3112
1506c	Seq. ID No. 3117	Seq. ID No. 3118
1508	Seq. ID No. 3125	Seq. ID No. 3126
1510d	Seq. ID No. 3133	Seq. ID No. 3134
1511	Seq. ID No. 3135	Seq. ID No. 3136
1512	Seq. ID No. 3137	Seq. ID No. 3138
1513b	Seq. ID No. 3141	Seq. ID No. 3142
1516	Seq. ID No. 3143	Seq. ID No. 3144
1517c	Seq. ID No. 3149	Seq. ID No. 3150
1520	Seq. ID No. 3155	Seq. ID No. 3156
1522	Seq. ID No. 3157	Seq. ID No. 3158
1523	Seq. ID No. 3159	Seq. ID No. 3160
1528	Seq. ID No. 3161	Seq. ID No. 3162
1530b	Seq. ID No. 3165	Seq. ID No. 3166

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1534b	Seq. ID No. 3171	Seq. ID No. 3172
1536b	Seq. ID No. 3177	Seq. ID No. 3178
1537	Seq. ID No. 3179	Seq. ID No. 3180
1543	Seq. ID No. 3183	Seq. ID No. 3184
1544	Seq. ID No. 3185	Seq. ID No. 3186
1547b	Seq. ID No. 3189	Seq. ID No. 3190
1548	Seq. ID No. 3191	Seq. ID No. 3192
1553b	Seq. ID No. 3197	Seq. ID No. 3198
1554c	Seq. ID No. 3203	Seq. ID No. 3204
1555	Seq. ID No. 3205	Seq. ID No. 3206
1556c	Seq. ID No. 3211	Seq. ID No. 3212
1557c	Seq. ID No. 3217	Seq. ID No. 3218
1559b	Seq. ID No. 3221	Seq. ID No. 3222
1564b	Seq. ID No. 3227	Seq. ID No. 3228
1565	Seq. ID No. 3229	Seq. ID No. 3230
1568b	Seq. ID No. 3233	Seq. ID No. 3234
1569	Seq. ID No. 3235	Seq. ID No. 3236
1571	Seq. ID No. 3239	Seq. ID No. 3240
1572e	Seq. ID No. 3249	Seq. ID No. 3250
1573	Seq. ID No. 3251	Seq. ID No. 3252
1576	Seq. ID No. 3253	Seq. ID No. 3254
1577b	Seq. ID No. 3257	Seq. ID No. 3258
1578	Seq. ID No. 3259	Seq. ID No. 3260
1580b	Seq. ID No. 3263	Seq. ID No. 3264
1581	Seq. ID No. 3265	Seq. ID No. 3266
1582c	Seq. ID No. 3271	Seq. ID No. 3272
1584	Seq. ID No. 3273	Seq. ID No. 3274
1585b	Seq. ID No. 3277	Seq. ID No. 3278
1587c	Seq. ID No. 3283	Seq. ID No. 3284

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1588	Seq. ID No. 3285	Seq. ID No. 3286
1590	Seq. ID No. 3287	Seq. ID No. 3288
1591	Seq. ID No. 3289	Seq. ID No. 3290
1592b	Seq. ID No. 3293	Seq. ID No. 3294
1593	Seq. ID No. 3295	Seq. ID No. 3296
1594b	Seq. ID No. 3299	Seq. ID No. 3300
1595b	Seq. ID No. 3303	Seq. ID No. 3304
1598b	Seq. ID No. 3307	Seq. ID No. 3308
1600c	Seq. ID No. 3313	Seq. ID No. 3314
1602	Seq. ID No. 3315	Seq. ID No. 3316
1606b	Seq. ID No. 3319	Seq. ID No. 3320
1607b	Seq. ID No. 3323	Seq. ID No. 3324
1610b	Seq. ID No. 3329	Seq. ID No. 3330
1616b	Seq. ID No. 3335	Seq. ID No. 3336
1619	Seq. ID No. 3337	Seq. ID No. 3338
1623c	Seq. ID No. 3347	Seq. ID No. 3348
1625c	Seq. ID No. 3355	Seq. ID No. 3356
1626b	Seq. ID No. 3359	Seq. ID No. 3360
1628b	Seq. ID No. 3363	Seq. ID No. 3364
1632b	Seq. ID No. 3367	Seq. ID No. 3368
1634c	Seq. ID No. 3377	Seq. ID No. 3378
1639b	Seq. ID No. 3379	Seq. ID No. 3380
1642b	Seq. ID No. 3383	Seq. ID No. 3384
1643b	Seq. ID No. 3387	Seq. ID No. 3388
1646f	Seq. ID No. 3399	Seq. ID No. 3400
1647	Seq. ID No. 3401	Seq. ID No. 3402
1648b	Seq. ID No. 3403	Seq. ID No. 3404
1649c	Seq. ID No. 3409	Seq. ID No. 3410
1652b	Seq. ID No. 3413	Seq. ID No. 3414

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1654	Seq. ID No. 3415	Seq. ID No. 3416
1656b	Seq. ID No. 3417	Seq. ID No. 3418
1659c	Seq. ID No. 3425	Seq. ID No. 3426
1660b	Seq. ID No. 3427	Seq. ID No. 3428
1662b	Seq. ID No. 3431	Seq. ID No. 3432
1664	Seq. ID No. 3435	Seq. ID No. 3436
1665a	Seq. ID No. 3437	Seq. ID No. 3438
1668	Seq. ID No. 3439	Seq. ID No. 3440
1670c	Seq. ID No. 3447	Seq. ID No. 3448
1673f	Seq. ID No. 3459	Seq. ID No. 3460
1674	Seq. ID No. 3461	Seq. ID No. 3462
1675c	Seq. ID No. 3467	Seq. ID No. 3468
1676	Seq. ID No. 3469	Seq. ID No. 3470
1677	Seq. ID No. 3471	Seq. ID No. 3472
1679	Seq. ID No. 3473	Seq. ID No. 3474
1680	Seq. ID No. 3475	Seq. ID No. 3476
1682b	Seq. ID No. 3479	Seq. ID No. 3480
1683b	Seq. ID No. 3483	Seq. ID No. 3484
1684	Seq. ID No. 3485	Seq. ID No. 3486
1685	Seq. ID No. 3487	Seq. ID No. 3488
1688c	Seq. ID No. 3495	Seq. ID No. 3496
1689c	Seq. ID No. 3501	Seq. ID No. 3502
1690b	Seq. ID No. 3505	Seq. ID No. 3506
1691	Seq. ID No. 3507	Seq. ID No. 3508
1692	Seq. ID No. 3509	Seq. ID No. 3510
1693	Seq. ID No. 3511	Seq. ID No. 3512
1694d	Seq. ID No. 3519	Seq. ID No. 3520
1696	Seq. ID No. 3521	Seq. ID No. 3522
1697b	Seq. ID No. 3525	Seq. ID No. 3526



**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1699b	Seq. ID No. 3529	Seq. ID No. 3530
1700b	Seq. ID No. 3533	Seq. ID No. 3534
1701b	Seq. ID No. 3537	Seq. ID No. 3538
1704b	Seq. ID No. 3543	Seq. ID No. 3544
1706	Seq. ID No. 3549	Seq. ID No. 3550
1707b	Seq. ID No. 3553	Seq. ID No. 3554
1710b	Seq. ID No. 3561	Seq. ID No. 3562
1712b	Seq. ID No. 3565	Seq. ID No. 3566
1715b	Seq. ID No. 3569	Seq. ID No. 3570
1722	Seq. ID No. 3575	Seq. ID No. 3576
1723b	Seq. ID No. 3579	Seq. ID No. 3580
1727	Seq. ID No. 3583	Seq. ID No. 3584
1728	Seq. ID No. 3585	Seq. ID No. 3586
1733	Seq. ID No. 3589	Seq. ID No. 3590
1737b	Seq. ID No. 3599	Seq. ID No. 3600
1738c	Seq. ID No. 3605	Seq. ID No. 3606
1739	Seq. ID No. 3607	Seq. ID No. 3608
1741	Seq. ID No. 3609	Seq. ID No. 3610
1743	Seq. ID No. 3611	Seq. ID No. 3612
1744b	Seq. ID No. 3615	Seq. ID No. 3616
1747	Seq. ID No. 3619	Seq. ID No. 3620
1752b	Seq. ID No. 3629	Seq. ID No. 3630
1756b	Seq. ID No. 3635	Seq. ID No. 3636
1757b	Seq. ID No. 3639	Seq. ID No. 3640
1759	Seq. ID No. 3641	Seq. ID No. 3642
1760	Seq. ID No. 3643	Seq. ID No. 3644
1762	Seq. ID No. 3645	Seq. ID No. 3646
1764c	Seq. ID No. 3651	Seq. ID No. 3652
1765	Seq. ID No. 3653	Seq. ID No. 3654

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1767b	Seq. ID No. 3659	Seq. ID No. 3660
1769b	Seq. ID No. 3663	Seq. ID No. 3664
1771	Seq. ID No. 3665	Seq. ID No. 3666
1773	Seq. ID No. 3667	Seq. ID No. 3668
1774	Seq. ID No. 3669	Seq. ID No. 3670
1775c	Seq. ID No. 3675	Seq. ID No. 3676
1780	Seq. ID No. 3681	Seq. ID No. 3682
1784b	Seq. ID No. 3689	Seq. ID No. 3690
1788c	Seq. ID No. 3695	Seq. ID No. 3696
1789b	Seq. ID No. 3699	Seq. ID No. 3700
1792c	Seq. ID No. 3709	Seq. ID No. 3710
1793c	Seq. ID No. 3715	Seq. ID No. 3716
1797b	Seq. ID No. 3721	Seq. ID No. 3722
1798c	Seq. ID No. 3727	Seq. ID No. 3728
1800	Seq. ID No. 3729	Seq. ID No. 3730
1802b	Seq. ID No. 3733	Seq. ID No. 3734
1803	Seq. ID No. 3735	Seq. ID No. 3736
1804b	Seq. ID No. 3739	Seq. ID No. 3740
1805	Seq. ID No. 3741	Seq. ID No. 3742
1806c	Seq. ID No. 3747	Seq. ID No. 3748
1807b	Seq. ID No. 3751	Seq. ID No. 3752
1808d	Seq. ID No. 3759	Seq. ID No. 3760
1809f	Seq. ID No. 3771	Seq. ID No. 3772
1810b	Seq. ID No. 3775	Seq. ID No. 3776
1811b	Seq. ID No. 3779	Seq. ID No. 3780
1812b	Seq. ID No. 3783	Seq. ID No. 3784
1815c	Seq. ID No. 3791	Seq. ID No. 3792
1816c	Seq. ID No. 3797	Seq. ID No. 3798
1819b	Seq. ID No. 3803	Seq. ID No. 3804

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1821	Seq. ID No. 3805	Seq. ID No. 3806
1823b	Seq. ID No. 3811	Seq. ID No. 3812
1825	Seq. ID No. 3813	Seq. ID No. 3814
1828	Seq. ID No. 3819	Seq. ID No. 3820
1830b	Seq. ID No. 3823	Seq. ID No. 3824
1833	Seq. ID No. 3825	Seq. ID No. 3826
1836b	Seq. ID No. 3833	Seq. ID No. 3834
1837	Seq. ID No. 3835	Seq. ID No. 3836
1838d	Seq. ID No. 3843	Seq. ID No. 3844
1839b	Seq. ID No. 3847	Seq. ID No. 3848
1842d	Seq. ID No. 3855	Seq. ID No. 3856
1843	Seq. ID No. 3857	Seq. ID No. 3858
1845c	Seq. ID No. 3863	Seq. ID No. 3864
1848b	Seq. ID No. 3867	Seq. ID No. 3868
1850c	Seq. ID No. 3873	Seq. ID No. 3874
1853b	Seq. ID No. 3877	Seq. ID No. 3878
1854b	Seq. ID No. 3881	Seq. ID No. 3882
1855	Seq. ID No. 3883	Seq. ID No. 3884
1856	Seq. ID No. 3885	Seq. ID No. 3886
1857d	Seq. ID No. 3893	Seq. ID No. 3894
1859	Seq. ID No. 3897	Seq. ID No. 3898
1861b	Seq. ID No. 3901	Seq. ID No. 3902
1863b	Seq. ID No. 3907	Seq. ID No. 3908
1865b	Seq. ID No. 3913	Seq. ID No. 3914
1868	Seq. ID No. 3915	Seq. ID No. 3916
1869	Seq. ID No. 3917	Seq. ID No. 3918
1870	Seq. ID No. 3919	Seq. ID No. 3920
1873c	Seq. ID No. 3925	Seq. ID No. 3926
1875c	Seq. ID No. 3929	Seq. ID No. 3930

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1877b	Seq. ID No. 3933	Seq. ID No. 3934
1878	Seq. ID No. 3935	Seq. ID No. 3936
1879	Seq. ID No. 3937	Seq. ID No. 3938
1884	Seq. ID No. 3941	Seq. ID No. 3942
1886	Seq. ID No. 3943	Seq. ID No. 3944
1887	Seq. ID No. 3945	Seq. ID No. 3946
1888b	Seq. ID No. 3949	Seq. ID No. 3950
1890	Seq. ID No. 3951	Seq. ID No. 3952
1891b	Seq. ID No. 3955	Seq. ID No. 3956
1893	Seq. ID No. 3957	Seq. ID No. 3958
1897c	Seq. ID No. 3971	Seq. ID No. 3972
1898b	Seq. ID No. 3975	Seq. ID No. 3976
1902b	Seq. ID No. 3983	Seq. ID No. 3984
1907	Seq. ID No. 3985	Seq. ID No. 3986
1912	Seq. ID No. 3987	Seq. ID No. 3988
1915b	Seq. ID No. 3991	Seq. ID No. 3992
1918d	Seq. ID No. 4003	Seq. ID No. 4004
1919c	Seq. ID No. 4009	Seq. ID No. 4010
1923b	Seq. ID No. 4013	Seq. ID No. 4014
1925	Seq. ID No. 4015	Seq. ID No. 4016
1926	Seq. ID No. 4017	Seq. ID No. 4018
1927b	Seq. ID No. 4021	Seq. ID No. 4022
1930	Seq. ID No. 4023	Seq. ID No. 4024
1931c	Seq. ID No. 4029	Seq. ID No. 4030
1932	Seq. ID No. 4031	Seq. ID No. 4032
1933b	Seq. ID No. 4035	Seq. ID No. 4036
1934	Seq. ID No. 4037	Seq. ID No. 4038
1936	Seq. ID No. 4039	Seq. ID No. 4040
1937e	Seq. ID No. 4049	Seq. ID No. 4050

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1939c	Seq. ID No. 4055	Seq. ID No. 4056
1940	Seq. ID No. 4057	Seq. ID No. 4058
1941b	Seq. ID No. 4061	Seq. ID No. 4062
1942	Seq. ID No. 4063	Seq. ID No. 4064
1943b	Seq. ID No. 4067	Seq. ID No. 4068
1944	Seq. ID No. 4069	Seq. ID No. 4070
1946c	Seq. ID No. 4075	Seq. ID No. 4076
1949	Seq. ID No. 4077	Seq. ID No. 4078
1950	Seq. ID No. 4079	Seq. ID No. 4080
1951d	Seq. ID No. 4087	Seq. ID No. 4088
1953	Seq. ID No. 4089	Seq. ID No. 4090
1954c	Seq. ID No. 4095	Seq. ID No. 4096
1956	Seq. ID No. 4097	Seq. ID No. 4098
1957	Seq. ID No. 4099	Seq. ID No. 4100
1958c	Seq. ID No. 4105	Seq. ID No. 4106
1960c	Seq. ID No. 4111	Seq. ID No. 4112
1962b	Seq. ID No. 4117	Seq. ID No. 4118
1965b	Seq. ID No. 4121	Seq. ID No. 4122
1966	Seq. ID No. 4123	Seq. ID No. 4124
1968	Seq. ID No. 4127	Seq. ID No. 4128
1969	Seq. ID No. 4129	Seq. ID No. 4130
1970b	Seq. ID No. 4133	Seq. ID No. 4134
1973	Seq. ID No. 4137	Seq. ID No. 4138
1977c	Seq. ID No. 4145	Seq. ID No. 4146
1979b	Seq. ID No. 4149	Seq. ID No. 4150
1982	Seq. ID No. 4157	Seq. ID No. 4158
1985b	Seq. ID No. 4161	Seq. ID No. 4162
1986	Seq. ID No. 4163	Seq. ID No. 4164
1987b	Seq. ID No. 4167	Seq. ID No. 4168

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1989c	Seq. ID No. 4173	Seq. ID No. 4174
1990c	Seq. ID No. 4179	Seq. ID No. 4180
1992b	Seq. ID No. 4185	Seq. ID No. 4186
1993c	Seq. ID No. 4191	Seq. ID No. 4192
1996	Seq. ID No. 4193	Seq. ID No. 4194
2000	Seq. ID No. 4195	Seq. ID No. 4196
2001	Seq. ID No. 4197	Seq. ID No. 4198
2003	Seq. ID No. 4199	Seq. ID No. 4200
2006	Seq. ID No. 4201	Seq. ID No. 4202
2008	Seq. ID No. 4203	Seq. ID No. 4204
2010	Seq. ID No. 4205	Seq. ID No. 4206
2011c	Seq. ID No. 4211	Seq. ID No. 4212
2013b	Seq. ID No. 4215	Seq. ID No. 4216
2014c	Seq. ID No. 4217	Seq. ID No. 4218
2015	Seq. ID No. 4219	Seq. ID No. 4220
2016h	Seq. ID No. 4235	Seq. ID No. 4236
2020	Seq. ID No. 4237	Seq. ID No. 4238
2021	Seq. ID No. 4239	Seq. ID No. 4240
2023b	Seq. ID No. 4243	Seq. ID No. 4244
2024d	Seq. ID No. 4251	Seq. ID No. 4252
2027	Seq. ID No. 4255	Seq. ID No. 4256
2030d	Seq. ID No. 4263	Seq. ID No. 4264
2033	Seq. ID No. 4267	Seq. ID No. 4268
2036	Seq. ID No. 4271	Seq. ID No. 4272
2037	Seq. ID No. 4273	Seq. ID No. 4274
2042	Seq. ID No. 4279	Seq. ID No. 4280
2043b	Seq. ID No. 4281	Seq. ID No. 4282
2044	Seq. ID No. 4283	Seq. ID No. 4284
2046b	Seq. ID No. 4291	Seq. ID No. 4292

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2047b	Seq. ID No. 4295	Seq. ID No. 4296
2050	Seq. ID No. 4299	Seq. ID No. 4300
2053	Seq. ID No. 4301	Seq. ID No. 4302
2054	Seq. ID No. 4303	Seq. ID No. 4304
2056	Seq. ID No. 4307	Seq. ID No. 4308
2057	Seq. ID No. 4309	Seq. ID No. 4310
2059b	Seq. ID No. 4313	Seq. ID No. 4314
2060b	Seq. ID No. 4317	Seq. ID No. 4318
2062c	Seq. ID No. 4323	Seq. ID No. 4324
2064	Seq. ID No. 4325	Seq. ID No. 4326
2065b	Seq. ID No. 4329	Seq. ID No. 4330
2066	Seq. ID No. 4331	Seq. ID No. 4332
2068	Seq. ID No. 4333	Seq. ID No. 4334
2069c	Seq. ID No. 4339	Seq. ID No. 4340
2074b	Seq. ID No. 4343	Seq. ID No. 4344
2075b	Seq. ID No. 4347	Seq. ID No. 4348
2076c	Seq. ID No. 4353	Seq. ID No. 4354
2078	Seq. ID No. 4355	Seq. ID No. 4356
2079a	Seq. ID No. 4357	Seq. ID No. 4358
2081b	Seq. ID No. 4365	Seq. ID No. 4366
2086b	Seq. ID No. 4369	Seq. ID No. 4370
2087b	Seq. ID No. 4373	Seq. ID No. 4374
2088	Seq. ID No. 4375	Seq. ID No. 4376
2091	Seq. ID No. 4377	Seq. ID No. 4378
2092	Seq. ID No. 4379	Seq. ID No. 4380
2093a	Seq. ID No. 4381	Seq. ID No. 4382
2094	Seq. ID No. 4383	Seq. ID No. 4384
2096d	Seq. ID No. 4391	Seq. ID No. 4392
2097	Seq. ID No. 4393	Seq. ID No. 4394

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2100	Seq. ID No. 4397	Seq. ID No. 4398
2104	Seq. ID No. 4401	Seq. ID No. 4402
2109b	Seq. ID No. 4411	Seq. ID No. 4412
2110c	Seq. ID No. 4417	Seq. ID No. 4418
2112c	Seq. ID No. 4423	Seq. ID No. 4424
2115c	Seq. ID No. 4431	Seq. ID No. 4432
2116	Seq. ID No. 4433	Seq. ID No. 4434
2117	Seq. ID No. 4435	Seq. ID No. 4436
2123	Seq. ID No. 4443	Seq. ID No. 4444
2124b	Seq. ID No. 4447	Seq. ID No. 4448
2125b	Seq. ID No. 4451	Seq. ID No. 4452
2128b	Seq. ID No. 4459	Seq. ID No. 4460
2133	Seq. ID No. 4461	Seq. ID No. 4462
2138c	Seq. ID No. 4467	Seq. ID No. 4468
2140b	Seq. ID No. 4471	Seq. ID No. 4472
2142b	Seq. ID No. 4475	Seq. ID No. 4476
2144b	Seq. ID No. 4479	Seq. ID No. 4480
2146	Seq. ID No. 4481	Seq. ID No. 4482
2147c	Seq. ID No. 4487	Seq. ID No. 4488
2149b	Seq. ID No. 4491	Seq. ID No. 4492
2153	Seq. ID No. 4501	Seq. ID No. 4502
2155b	Seq. ID No. 4505	Seq. ID No. 4506
2156c	Seq. ID No. 4511	Seq. ID No. 4512
2160d	Seq. ID No. 4523	Seq. ID No. 4524
2164	Seq. ID No. 4531	Seq. ID No. 4532
2165	Seq. ID No. 4533	Seq. ID No. 4534
2166b	Seq. ID No. 4537	Seq. ID No. 4538
2169	Seq. ID No. 4539	Seq. ID No. 4540
2171	Seq. ID No. 4541	Seq. ID No. 4542



TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2172	Seq. ID No. 4543	Seq. ID No. 4544
2173b	Seq. ID No. 4547	Seq. ID No. 4548
2174	Seq. ID No. 4549	Seq. ID No. 4550
2176d	Seq. ID No. 4559	Seq. ID No. 4560
2179b	Seq. ID No. 4565	Seq. ID No. 4566
2180	Seq. ID No. 4567	Seq. ID No. 4568
2181b	Seq. ID No. 4571	Seq. ID No. 4572
2183	Seq. ID No. 4575	Seq. ID No. 4576
2185	Seq. ID No. 4577	Seq. ID No. 4578
2186b	Seq. ID No. 4581	Seq. ID No. 4582
2189b	Seq. ID No. 4585	Seq. ID No. 4586
2193	Seq. ID No. 4591	Seq. ID No. 4592
2194c	Seq. ID No. 4595	Seq. ID No. 4596
2196	Seq. ID No. 4597	Seq. ID No. 4598
2197c	Seq. ID No. 4603	Seq. ID No. 4604
2201b	Seq. ID No. 4607	Seq. ID No. 4608
2203	Seq. ID No. 4609	Seq. ID No. 4610
2204	Seq. ID No. 4611	Seq. ID No. 4612
2206b	Seq. ID No. 4615	Seq. ID No. 4616
2209	Seq. ID No. 4623	Seq. ID No. 4624
2212b	Seq. ID No. 4627	Seq. ID No. 4628
2215b	Seq. ID No. 4631	Seq. ID No. 4632
2216b	Seq. ID No. 4635	Seq. ID No. 4636
2218	Seq. ID No. 4637	Seq. ID No. 4638
2219c	Seq. ID No. 4643	Seq. ID No. 4644
2220c	Seq. ID No. 4649	Seq. ID No. 4650
2221	Seq. ID No. 4651	Seq. ID No. 4652
2222	Seq. ID No. 4653	Seq. ID No. 4654
2223b	Seq. ID No. 4657	Seq. ID No. 4658

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2226	Seq. ID No. 4661	Seq. ID No. 4662
2227	Seq. ID No. 4663	Seq. ID No. 4664
2228c	Seq. ID No. 4669	Seq. ID No. 4670
2231	Seq. ID No. 4671	Seq. ID No. 4672
2232	Seq. ID No. 4673	Seq. ID No. 4674
2234c	Seq. ID No. 4679	Seq. ID No. 4680
2238	Seq. ID No. 4685	Seq. ID No. 4686
2240c	Seq. ID No. 4693	Seq. ID No. 4694
2244	Seq. ID No. 4697	Seq. ID No. 4698
2248	Seq. ID No. 4703	Seq. ID No. 4704
2249	Seq. ID No. 4705	Seq. ID No. 4706
2253d	Seq. ID No. 4713	Seq. ID No. 4714
2255b	Seq. ID No. 4717	Seq. ID No. 4718
2256	Seq. ID No. 4719	Seq. ID No. 4720
2259b	Seq. ID No. 4725	Seq. ID No. 4726
2260c	Seq. ID No. 4729	Seq. ID No. 4730
2262	Seq. ID No. 4731	Seq. ID No. 4732
2263	Seq. ID No. 4733	Seq. ID No. 4734
2267	Seq. ID No. 4739	Seq. ID No. 4740
2269	Seq. ID No. 4743	Seq. ID No. 4744
2270	Seq. ID No. 4745	Seq. ID No. 4746
2272	Seq. ID No. 4747	Seq. ID No. 4748
2273	Seq. ID No. 4749	Seq. ID No. 4750
2274	Seq. ID No. 4751	Seq. ID No. 4752
2275c	Seq. ID No. 4757	Seq. ID No. 4758
2276d	Seq. ID No. 4765	Seq. ID No. 4766
2277b	Seq. ID No. 4769	Seq. ID No. 4770
2278d	Seq. ID No. 4777	Seq. ID No. 4778
2280	Seq. ID No. 4779	Seq. ID No. 4780

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2284	Seq. ID No. 4781	Seq. ID No. 4782
2286b	Seq. ID No. 4787	Seq. ID No. 4788
2288	Seq. ID No. 4789	Seq. ID No. 4790
2290	Seq. ID No. 4791	Seq. ID No. 4792
2291c	Seq. ID No. 4797	Seq. ID No. 4798
2292c	Seq. ID No. 4803	Seq. ID No. 4804
2297	Seq. ID No. 4807	Seq. ID No. 4808
2298	Seq. ID No. 4809	Seq. ID No. 4810
2299	Seq. ID No. 4811	Seq. ID No. 4812
2300	Seq. ID No. 4813	Seq. ID No. 4814
2301	Seq. ID No. 4815	Seq. ID No. 4816
2304	Seq. ID No. 4821	Seq. ID No. 4822
2306c	Seq. ID No. 4823	Seq. ID No. 4824
2307	Seq. ID No. 4825	Seq. ID No. 4826
2308	Seq. ID No. 4827	Seq. ID No. 4828
2309c	Seq. ID No. 4833	Seq. ID No. 4834
2310	Seq. ID No. 4835	Seq. ID No. 4836
2311	Seq. ID No. 4837	Seq. ID No. 4838
2312c	Seq. ID No. 4843	Seq. ID No. 4844
2314	Seq. ID No. 4845	Seq. ID No. 4846
2315	Seq. ID No. 4847	Seq. ID No. 4848
2316	Seq. ID No. 4849	Seq. ID No. 4850
2321c	Seq. ID No. 4859	Seq. ID No. 4860
2322	Seq. ID No. 4861	Seq. ID No. 4862
2327	Seq. ID No. 4865	Seq. ID No. 4866
2328	Seq. ID No. 4867	Seq. ID No. 4868
2329d	Seq. ID No. 4875	Seq. ID No. 4876
2330	Seq. ID No. 4877	Seq. ID No. 4878
2331	Seq. ID No. 4879	Seq. ID No. 4880

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2333	Seq. ID No. 4881	Seq. ID No. 4882
2335	Seq. ID No. 4883	Seq. ID No. 4884
2336	Seq. ID No. 4885	Seq. ID No. 4886
2337b	Seq. ID No. 4887	Seq. ID No. 4888
2338c	Seq. ID No. 4893	Seq. ID No. 4894
2342c	Seq. ID No. 4899	Seq. ID No. 4900
2344	Seq. ID No. 4901	Seq. ID No. 4902
2345	Seq. ID No. 4903	Seq. ID No. 4904
2347	Seq. ID No. 4905	Seq. ID No. 4906
2348	Seq. ID No. 4907	Seq. ID No. 4908
2349b	Seq. ID No. 4911	Seq. ID No. 4912
2353	Seq. ID No. 4915	Seq. ID No. 4916
2354	Seq. ID No. 4917	Seq. ID No. 4918
2357	Seq. ID No. 4919	Seq. ID No. 4920
2358	Seq. ID No. 4921	Seq. ID No. 4922
2361b	Seq. ID No. 4927	Seq. ID No. 4928
2363b	Seq. ID No. 4931	Seq. ID No. 4932
2365b	Seq. ID No. 4935	Seq. ID No. 4936
2366b	Seq. ID No. 4939	Seq. ID No. 4940
2367	Seq. ID No. 4941	Seq. ID No. 4942
2368	Seq. ID No. 4943	Seq. ID No. 4944
2369	Seq. ID No. 4945	Seq. ID No. 4946
2370	Seq. ID No. 4947	Seq. ID No. 4948
2373	Seq. ID No. 4953	Seq. ID No. 4954
2374b	Seq. ID No. 4957	Seq. ID No. 4958
2376	Seq. ID No. 4959	Seq. ID No. 4960
2377b	Seq. ID No. 4963	Seq. ID No. 4964
2378	Seq. ID No. 4965	Seq. ID No. 4966
2379b	Seq. ID No. 4969	Seq. ID No. 4970

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2380	Seq. ID No. 4971	Seq. ID No. 4972
2381	Seq. ID No. 4973	Seq. ID No. 4974
2384b	Seq. ID No. 4979	Seq. ID No. 4980
2387	Seq. ID No. 4985	Seq. ID No. 4986
2391	Seq. ID No. 4989	Seq. ID No. 4990
2392	Seq. ID No. 4991	Seq. ID No. 4992
2395	Seq. ID No. 4995	Seq. ID No. 4996
2396	Seq. ID No. 4997	Seq. ID No. 4998
2398	Seq. ID No. 5001	Seq. ID No. 5002
2399c	Seq. ID No. 5007	Seq. ID No. 5008
2401	Seq. ID No. 5009	Seq. ID No. 5010
2403b	Seq. ID No. 5017	Seq. ID No. 5018
2404b	Seq. ID No. 5021	Seq. ID No. 5022
2409b	Seq. ID No. 5027	Seq. ID No. 5028
2410	Seq. ID No. 5029	Seq. ID No. 5030
2415b	Seq. ID No. 5039	Seq. ID No. 5040
2417b	Seq. ID No. 5047	Seq. ID No. 5048
2418b	Seq. ID No. 5051	Seq. ID No. 5052
2420	Seq. ID No. 5053	Seq. ID No. 5054
2421	Seq. ID No. 5055	Seq. ID No. 5056
2422c	Seq. ID No. 5059	Seq. ID No. 5060
2423a	Seq. ID No. 5061	Seq. ID No. 5062
2424c	Seq. ID No. 5069	Seq. ID No. 5070
2428c	Seq. ID No. 5077	Seq. ID No. 5078
2429	Seq. ID No. 5079	Seq. ID No. 5080
2432	Seq. ID No. 5081	Seq. ID No. 5082
2433	Seq. ID No. 5083	Seq. ID No. 5084
2440	Seq. ID No. 5087	Seq. ID No. 5088
2442b	Seq. ID No. 5091	Seq. ID No. 5092

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2443	Seq. ID No. 5093	Seq. ID No. 5094
2444b	Seq. ID No. 5097	Seq. ID No. 5098
2445	Seq. ID No. 5103	Seq. ID No. 5104
2448b	Seq. ID No. 5105	Seq. ID No. 5106
2449b	Seq. ID No. 5109	Seq. ID No. 5110
2451	Seq. ID No. 5111	Seq. ID No. 5112
2452	Seq. ID No. 5113	Seq. ID No. 5114
2453	Seq. ID No. 5115	Seq. ID No. 5116
2455	Seq. ID No. 5117	Seq. ID No. 5118
2456e	Seq. ID No. 5127	Seq. ID No. 5128
2458g	Seq. ID No. 5141	Seq. ID No. 5142
2461b	Seq. ID No. 5145	Seq. ID No. 5146
2462b	Seq. ID No. 5149	Seq. ID No. 5150
2464	Seq. ID No. 5153	Seq. ID No. 5154
2465b	Seq. ID No. 5157	Seq. ID No. 5158
2469b	Seq. ID No. 5165	Seq. ID No. 5166
2471	Seq. ID No. 5169	Seq. ID No. 5170
2473	Seq. ID No. 5171	Seq. ID No. 5172
2474c	Seq. ID No. 5177	Seq. ID No. 5178
2475c	Seq. ID No. 5183	Seq. ID No. 5184
2477	Seq. ID No. 5185	Seq. ID No. 5186
2480	Seq. ID No. 5187	Seq. ID No. 5188
2482	Seq. ID No. 5193	Seq. ID No. 5194
2483	Seq. ID No. 5195	Seq. ID No. 5196
2485	Seq. ID No. 5201	Seq. ID No. 5202
2489	Seq. ID No. 5203	Seq. ID No. 5204
2490	Seq. ID No. 5205	Seq. ID No. 5206
2492b	Seq. ID No. 5209	Seq. ID No. 5210
2494	Seq. ID No. 5211	Seq. ID No. 5212

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2495b	Seq. ID No. 5215	Seq. ID No. 5216
2497b	Seq. ID No. 5219	Seq. ID No. 5220
2500c	Seq. ID No. 5227	Seq. ID No. 5228
2501b	Seq. ID No. 5231	Seq. ID No. 5232
2504b	Seq. ID No. 5235	Seq. ID No. 5236
2505	Seq. ID No. 5237	Seq. ID No. 5238
2506	Seq. ID No. 5239	Seq. ID No. 5240
2507c	Seq. ID No. 5243	Seq. ID No. 5244
2510	Seq. ID No. 5245	Seq. ID No. 5246
2512c	Seq. ID No. 5247	Seq. ID No. 5248
2513c	Seq. ID No. 5253	Seq. ID No. 5254
2514	Seq. ID No. 5255	Seq. ID No. 5256
2515	Seq. ID No. 5257	Seq. ID No. 5258
2516b	Seq. ID No. 5261	Seq. ID No. 5262
2517a	Seq. ID No. 5263	Seq. ID No. 5264
2519b	Seq. ID No. 5271	Seq. ID No. 5272
2520b	Seq. ID No. 5275	Seq. ID No. 5276
2523	Seq. ID No. 5283	Seq. ID No. 5284
2527b	Seq. ID No. 5291	Seq. ID No. 5292
2528d	Seq. ID No. 5299	Seq. ID No. 5300
2534	Seq. ID No. 5305	Seq. ID No. 5306
2535b	Seq. ID No. 5309	Seq. ID No. 5310
2538	Seq. ID No. 5311	Seq. ID No. 5312
2541	Seq. ID No. 5313	Seq. ID No. 5314
2542c	Seq. ID No. 5319	Seq. ID No. 5320
2544	Seq. ID No. 5323	Seq. ID No. 5324
2545	Seq. ID No. 5325	Seq. ID No. 5326
2548b	Seq. ID No. 5335	Seq. ID No. 5336
2549	Seq. ID No. 5337	Seq. ID No. 5338

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2550c	Seq. ID No. 5341	Seq. ID No. 5342
2552	Seq. ID No. 5345	Seq. ID No. 5346
2554b	Seq. ID No. 5351	Seq. ID No. 5352
2555b	Seq. ID No. 5355	Seq. ID No. 5356
2558b	Seq. ID No. 5363	Seq. ID No. 5364
2559	Seq. ID No. 5365	Seq. ID No. 5366
2561	Seq. ID No. 5367	Seq. ID No. 5368
2562c	Seq. ID No. 5371	Seq. ID No. 5372
2563	Seq. ID No. 5373	Seq. ID No. 5374
2564d	Seq. ID No. 5381	Seq. ID No. 5382
2566	Seq. ID No. 5383	Seq. ID No. 5384
2567b	Seq. ID No. 5387	Seq. ID No. 5388
2568	Seq. ID No. 5389	Seq. ID No. 5390
2572	Seq. ID No. 5391	Seq. ID No. 5392
2573	Seq. ID No. 5393	Seq. ID No. 5394
2575	Seq. ID No. 5395	Seq. ID No. 5396
2576	Seq. ID No. 5397	Seq. ID No. 5398
2578	Seq. ID No. 5399	Seq. ID No. 5400
2579b	Seq. ID No. 5401	Seq. ID No. 5402
2581	Seq. ID No. 5403	Seq. ID No. 5404
2582c	Seq. ID No. 5409	Seq. ID No. 5410
2585	Seq. ID No. 5411	Seq. ID No. 5412
2587b	Seq. ID No. 5415	Seq. ID No. 5416
2588	Seq. ID No. 5417	Seq. ID No. 5418
2589	Seq. ID No. 5419	Seq. ID No. 5420
2591	Seq. ID No. 5421	Seq. ID No. 5422
2592	Seq. ID No. 5423	Seq. ID No. 5424
2593b	Seq. ID No. 5427	Seq. ID No. 5428
2594b	Seq. ID No. 5431	Seq. ID No. 5432



TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2596	Seq. ID No. 5433	Seq. ID No. 5434
2597c	Seq. ID No. 5439	Seq. ID No. 5440
2598	Seq. ID No. 5441	Seq. ID No. 5442
2602	Seq. ID No. 5443	Seq. ID No. 5444
2605b	Seq. ID No. 5447	Seq. ID No. 5448
2606	Seq. ID No. 5449	Seq. ID No. 5450
2608	Seq. ID No. 5451	Seq. ID No. 5452
2610	Seq. ID No. 5453	Seq. ID No. 5454
2611	Seq. ID No. 5455	Seq. ID No. 5456
2613	Seq. ID No. 5457	Seq. ID No. 5458
2616h	Seq. ID No. 5473	Seq. ID No. 5474
2617b	Seq. ID No. 5477	Seq. ID No. 5478
2619	Seq. ID No. 5483	Seq. ID No. 5484
2621a	Seq. ID No. 5487	Seq. ID No. 5488
2623b	Seq. ID No. 5491	Seq. ID No. 5492
2624b	Seq. ID No. 5495	Seq. ID No. 5496
2625b	Seq. ID No. 5499	Seq. ID No. 5500
2626b	Seq. ID No. 5503	Seq. ID No. 5504
2627b	Seq. ID No. 5507	Seq. ID No. 5508
2628	Seq. ID No. 5509	Seq. ID No. 5510
2629b	Seq. ID No. 5513	Seq. ID No. 5514
2633e	Seq. ID No. 5527	Seq. ID No. 5528
2637b	Seq. ID No. 5531	Seq. ID No. 5532
2643b	Seq. ID No. 5537	Seq. ID No. 5538
2645	Seq. ID No. 5539	Seq. ID No. 5540
2647	Seq. ID No. 5541	Seq. ID No. 5542
2649	Seq. ID No. 5547	Seq. ID No. 5548
2652b	Seq. ID No. 5553	Seq. ID No. 5554
2655b	Seq. ID No. 5557	Seq. ID No. 5558

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2656	Seq. ID No. 5559	Seq. ID No. 5560
2658b	Seq. ID No. 5563	Seq. ID No. 5564
2659b	Seq. ID No. 5567	Seq. ID No. 5568
2662	Seq. ID No. 5571	Seq. ID No. 5572
2664b	Seq. ID No. 5575	Seq. ID No. 5576
2666b	Seq. ID No. 5581	Seq. ID No. 5582
2667b	Seq. ID No. 5585	Seq. ID No. 5586
2669c	Seq. ID No. 5591	Seq. ID No. 5592
2674b	Seq. ID No. 5599	Seq. ID No. 5600
2676	Seq. ID No. 5601	Seq. ID No. 5602
2677b	Seq. ID No. 5605	Seq. ID No. 5606
2679d	Seq. ID No. 5615	Seq. ID No. 5616
2680c	Seq. ID No. 5621	Seq. ID No. 5622
2684b	Seq. ID No. 5629	Seq. ID No. 5630
2686	Seq. ID No. 5631	Seq. ID No. 5632
2688c	Seq. ID No. 5637	Seq. ID No. 5638
2690c	Seq. ID No. 5647	Seq. ID No. 5648
2693	Seq. ID No. 5651	Seq. ID No. 5652
2694b	Seq. ID No. 5655	Seq. ID No. 5656
2695	Seq. ID No. 5657	Seq. ID No. 5658
2696b	Seq. ID No. 5661	Seq. ID No. 5662
2709	Seq. ID No. 5665	Seq. ID No. 5666
2712	Seq. ID No. 5669	Seq. ID No. 5670
2713	Seq. ID No. 5671	Seq. ID No. 5672
2714	Seq. ID No. 5673	Seq. ID No. 5674
2716c	Seq. ID No. 5679	Seq. ID No. 5680
2718c	Seq. ID No. 5685	Seq. ID No. 5686
2721b	Seq. ID No. 5693	Seq. ID No. 5694
2722b	Seq. ID No. 5697	Seq. ID No. 5698

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2723	Seq. ID No. 5699	Seq. ID No. 5700
2724	Seq. ID No. 5701	Seq. ID No. 5702
2726	Seq. ID No. 5707	Seq. ID No. 5708
2731b	Seq. ID No. 5715	Seq. ID No. 5716
2732	Seq. ID No. 5717	Seq. ID No. 5718
2734c	Seq. ID No. 5723	Seq. ID No. 5724
2735b	Seq. ID No. 5727	Seq. ID No. 5728
2738d	Seq. ID No. 5735	Seq. ID No. 5736
2742b	Seq. ID No. 5739	Seq. ID No. 5740
2745b	Seq. ID No. 5749	Seq. ID No. 5750
2746	Seq. ID No. 5751	Seq. ID No. 5752
2747b	Seq. ID No. 5755	Seq. ID No. 5756
2748c	Seq. ID No. 5761	Seq. ID No. 5762
2749e	Seq. ID No. 5771	Seq. ID No. 5772
2750b	Seq. ID No. 5775	Seq. ID No. 5776
2752	Seq. ID No. 5777	Seq. ID No. 5778
2753	Seq. ID No. 5779	Seq. ID No. 5780
2757b	Seq. ID No. 5783	Seq. ID No. 5784
2758c	Seq. ID No. 5789	Seq. ID No. 5790
2759b	Seq. ID No. 5795	Seq. ID No. 5796
2760c	Seq. ID No. 5801	Seq. ID No. 5802
2762	Seq. ID No. 5803	Seq. ID No. 5804
2763c	Seq. ID No. 5809	Seq. ID No. 5810
2765c	Seq. ID No. 5815	Seq. ID No. 5816
2766b	Seq. ID No. 5819	Seq. ID No. 5820
2768c	Seq. ID No. 5825	Seq. ID No. 5826
2771b	Seq. ID No. 5833	Seq. ID No. 5834
2773	Seq. ID No. 5835	Seq. ID No. 5836
2774c	Seq. ID No. 5841	Seq. ID No. 5842

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2776b	Seq. ID No. 5845	Seq. ID No. 5846
2777	Seq. ID No. 5847	Seq. ID No. 5848
2778	Seq. ID No. 5849	Seq. ID No. 5850
2779	Seq. ID No. 5851	Seq. ID No. 5852
2780	Seq. ID No. 5853	Seq. ID No. 5854
2784	Seq. ID No. 5855	Seq. ID No. 5856
2785b	Seq. ID No. 5859	Seq. ID No. 5860
2786c	Seq. ID No. 5865	Seq. ID No. 5866
2787c	Seq. ID No. 5871	Seq. ID No. 5872
2789	Seq. ID No. 5875	Seq. ID No. 5876
2790	Seq. ID No. 5877	Seq. ID No. 5878
2793	Seq. ID No. 5881	Seq. ID No. 5882
2798	Seq. ID No. 5887	Seq. ID No. 5888
2799b	Seq. ID No. 5891	Seq. ID No. 5892
2801b	Seq. ID No. 5895	Seq. ID No. 5896
2804	Seq. ID No. 5897	Seq. ID No. 5898
2805b	Seq. ID No. 5901	Seq. ID No. 5902
2809	Seq. ID No. 5903	Seq. ID No. 5904
2810d	Seq. ID No. 5911	Seq. ID No. 5912
2812	Seq. ID No. 5913	Seq. ID No. 5914
2814	Seq. ID No. 5915	Seq. ID No. 5916
2815	Seq. ID No. 5917	Seq. ID No. 5918
2816	Seq. ID No. 5919	Seq. ID No. 5920
2818e	Seq. ID No. 5929	Seq. ID No. 5930
2819	Seq. ID No. 5931	Seq. ID No. 5932
2820	Seq. ID No. 5933	Seq. ID No. 5934
2821b	Seq. ID No. 5937	Seq. ID No. 5938
2822b	Seq. ID No. 5941	Seq. ID No. 5942
2823	Seq. ID No. 5943	Seq. ID No. 5944

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2824b	Seq. ID No. 5947	Seq. ID No. 5948
2829b	Seq. ID No. 5951	Seq. ID No. 5952
2831b	Seq. ID No. 5953	Seq. ID No. 5954
2832	Seq. ID No. 5955	Seq. ID No. 5956
2833	Seq. ID No. 5957	Seq. ID No. 5958
2834b	Seq. ID No. 5961	Seq. ID No. 5962
2842b	Seq. ID No. 5969	Seq. ID No. 5970
2843b	Seq. ID No. 5973	Seq. ID No. 5974
2846b	Seq. ID No. 5979	Seq. ID No. 5980
2848	Seq. ID No. 5981	Seq. ID No. 5982
2851	Seq. ID No. 5985	Seq. ID No. 5986
2853	Seq. ID No. 5989	Seq. ID No. 5990
2854b	Seq. ID No. 5993	Seq. ID No. 5994
2856c	Seq. ID No. 6001	Seq. ID No. 6002
2857	Seq. ID No. 6003	Seq. ID No. 6004
2860c	Seq. ID No. 6011	Seq. ID No. 6012
2863	Seq. ID No. 6015	Seq. ID No. 6016
2864	Seq. ID No. 6017	Seq. ID No. 6018
2868b	Seq. ID No. 6021	Seq. ID No. 6022
2869c	Seq. ID No. 6027	Seq. ID No. 6028
2871	Seq. ID No. 6029	Seq. ID No. 6030
2875	Seq. ID No. 6033	Seq. ID No. 6034
2877	Seq. ID No. 6035	Seq. ID No. 6036
2879c	Seq. ID No. 6041	Seq. ID No. 6042
2881	Seq. ID No. 6043	Seq. ID No. 6044
2883d	Seq. ID No. 6053	Seq. ID No. 6054
2886b	Seq. ID No. 6057	Seq. ID No. 6058
2890	Seq. ID No. 6065	Seq. ID No. 6066
2891c	Seq. ID No. 6071	Seq. ID No. 6072

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2894c	Seq. ID No. 6079	Seq. ID No. 6080
2897b	Seq. ID No. 6085	Seq. ID No. 6086
2900b	Seq. ID No. 6089	Seq. ID No. 6090
2902	Seq. ID No. 6095	Seq. ID No. 6096
2904	Seq. ID No. 6097	Seq. ID No. 6098
2905b	Seq. ID No. 6101	Seq. ID No. 6102
2906	Seq. ID No. 6103	Seq. ID No. 6104
2909d	Seq. ID No. 6111	Seq. ID No. 6112
2912	Seq. ID No. 6113	Seq. ID No. 6114
2913b	Seq. ID No. 6117	Seq. ID No. 6118
2915c	Seq. ID No. 6123	Seq. ID No. 6124
2916	Seq. ID No. 6125	Seq. ID No. 6126
2918	Seq. ID No. 6129	Seq. ID No. 6130
2920	Seq. ID No. 6131	Seq. ID No. 6132
2921	Seq. ID No. 6133	Seq. ID No. 6134
2923c	Seq. ID No. 6141	Seq. ID No. 6142
2925b	Seq. ID No. 6145	Seq. ID No. 6146
2926b	Seq. ID No. 6149	Seq. ID No. 6150
2928c	Seq. ID No. 6157	Seq. ID No. 6158
2931c	Seq. ID No. 6165	Seq. ID No. 6166
2933b	Seq. ID No. 6169	Seq. ID No. 6170
2934	Seq. ID No. 6171	Seq. ID No. 6172
2935b	Seq. ID No. 6175	Seq. ID No. 6176
2936	Seq. ID No. 6177	Seq. ID No. 6178
2939b	Seq. ID No. 6181	Seq. ID No. 6182
2941c	Seq. ID No. 6187	Seq. ID No. 6188
2943d	Seq. ID No. 6195	Seq. ID No. 6196
2947	Seq. ID No. 6201	Seq. ID No. 6202
2948d	Seq. ID No. 6209	Seq. ID No. 6210

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2950b	Seq. ID No. 6213	Seq. ID No. 6214
2951	Seq. ID No. 6215	Seq. ID No. 6216
2954	Seq. ID No. 6219	Seq. ID No. 6220
2955g	Seq. ID No. 6233	Seq. ID No. 6234
2957	Seq. ID No. 6235	Seq. ID No. 6236
2959	Seq. ID No. 6243	Seq. ID No. 6244
2962b	Seq. ID No. 6249	Seq. ID No. 6250
2963	Seq. ID No. 6251	Seq. ID No. 6252
2965c	Seq. ID No. 6257	Seq. ID No. 6258
2967	Seq. ID No. 6261	Seq. ID No. 6262
2969	Seq. ID No. 6263	Seq. ID No. 6264
2971b	Seq. ID No. 6271	Seq. ID No. 6272
2974b	Seq. ID No. 6275	Seq. ID No. 6276
2975	Seq. ID No. 6277	Seq. ID No. 6278
2977b	Seq. ID No. 6281	Seq. ID No. 6282
2979	Seq. ID No. 6287	Seq. ID No. 6288
2980e	Seq. ID No. 6297	Seq. ID No. 6298
2984	Seq. ID No. 6299	Seq. ID No. 6300
2986c	Seq. ID No. 6305	Seq. ID No. 6306
2988c	Seq. ID No. 6311	Seq. ID No. 6312
2990	Seq. ID No. 6315	Seq. ID No. 6316
2991c	Seq. ID No. 6321	Seq. ID No. 6322
2992	Seq. ID No. 6323	Seq. ID No. 6324
2993b	Seq. ID No. 6327	Seq. ID No. 6328
2995b	Seq. ID No. 6331	Seq. ID No. 6332
2997	Seq. ID No. 6333	Seq. ID No. 6334
2998b	Seq. ID No. 6337	Seq. ID No. 6338
2999	Seq. ID No. 6339	Seq. ID No. 6340
3001	Seq. ID No. 6341	Seq. ID No. 6342

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
3003	Seq. ID No. 6343	Seq. ID No. 6344
3005	Seq. ID No. 6345	Seq. ID No. 6346
3008d	Seq. ID No. 6353	Seq. ID No. 6354
3010b	Seq. ID No. 6357	Seq. ID No. 6358
3012	Seq. ID No. 6359	Seq. ID No. 6360
3015	Seq. ID No. 6361	Seq. ID No. 6362
3016c	Seq. ID No. 6367	Seq. ID No. 6368
3017	Seq. ID No. 6369	Seq. ID No. 6370
3018b	Seq. ID No. 6373	Seq. ID No. 6374
3020	Seq. ID No. 6375	Seq. ID No. 6376
3021	Seq. ID No. 6377	Seq. ID No. 6378
3022	Seq. ID No. 6379	Seq. ID No. 6380
3026b	Seq. ID No. 6389	Seq. ID No. 6390
3028c	Seq. ID No. 6395	Seq. ID No. 6396
3029b	Seq. ID No. 6399	Seq. ID No. 6400
3031b	Seq. ID No. 6403	Seq. ID No. 6404
3032b	Seq. ID No. 6407	Seq. ID No. 6408
3033b	Seq. ID No. 6411	Seq. ID No. 6412
3035	Seq. ID No. 6413	Seq. ID No. 6414
3037b	Seq. ID No. 6417	Seq. ID No. 6418
3040b	Seq. ID No. 6423	Seq. ID No. 6424
3044	Seq. ID No. 6433	Seq. ID No. 6434
3045b	Seq. ID No. 6437	Seq. ID No. 6438
3048a	Seq. ID No. 6439	Seq. ID No. 6440
3049c	Seq. ID No. 6445	Seq. ID No. 6446
3051b	Seq. ID No. 6449	Seq. ID No. 6450
3052	Seq. ID No. 6451	Seq. ID No. 6452
3055b	Seq. ID No. 6457	Seq. ID No. 6458
3057	Seq. ID No. 6459	Seq. ID No. 6460



TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3059	Seq. ID No. 6461	Seq. ID No. 6462
3060	Seq. ID No. 6463	Seq. ID No. 6464
3065b	Seq. ID No. 6477	Seq. ID No. 6478
3067	Seq. ID No. 6481	Seq. ID No. 6482
3068	Seq. ID No. 6483	Seq. ID No. 6484
3071	Seq. ID No. 6487	Seq. ID No. 6488
3072a	Seq. ID No. 6489	Seq. ID No. 6490
3073	Seq. ID No. 6491	Seq. ID No. 6492
3074	Seq. ID No. 6493	Seq. ID No. 6494
3075	Seq. ID No. 6495	Seq. ID No. 6496
3077c	Seq. ID No. 6503	Seq. ID No. 6504
3078	Seq. ID No. 6505	Seq. ID No. 6506
3081b	Seq. ID No. 6511	Seq. ID No. 6512
3083d	Seq. ID No. 6515	Seq. ID No. 6516
3086	Seq. ID No. 6519	Seq. ID No. 6520
3087c	Seq. ID No. 6523	Seq. ID No. 6524
3088	Seq. ID No. 6525	Seq. ID No. 6526
3089b	Seq. ID No. 6529	Seq. ID No. 6530
3090	Seq. ID No. 6531	Seq. ID No. 6532
3091	Seq. ID No. 6533	Seq. ID No. 6534
3092b	Seq. ID No. 6537	Seq. ID No. 6538
3097	Seq. ID No. 6545	Seq. ID No. 6546
3098c	Seq. ID No. 6551	Seq. ID No. 6552
3099	Seq. ID No. 6553	Seq. ID No. 6554
3101	Seq. ID No. 6559	Seq. ID No. 6560
3103b	Seq. ID No. 6563	Seq. ID No. 6564
3105	Seq. ID No. 6567	Seq. ID No. 6568
3108b	Seq. ID No. 6577	Seq. ID No. 6578
3109	Seq. ID No. 6579	Seq. ID No. 6580

**TABLE 18: GLIMMER™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
3110b	Seq. ID No. 6583	Seq. ID No. 6584
3113	Seq. ID No. 6585	Seq. ID No. 6586
3116	Seq. ID No. 6587	Seq. ID No. 6588
3118a	Seq. ID No. 6589	Seq. ID No. 6590
3119f	Seq. ID No. 6603	Seq. ID No. 6604
3121	Seq. ID No. 6605	Seq. ID No. 6606
3122b	Seq. ID No. 6609	Seq. ID No. 6610
3123b	Seq. ID No. 6613	Seq. ID No. 6614
3124	Seq. ID No. 6615	Seq. ID No. 6616
3126	Seq. ID No. 6617	Seq. ID No. 6618
3129b	Seq. ID No. 6621	Seq. ID No. 6622
3131	Seq. ID No. 6623	Seq. ID No. 6624
3134b	Seq. ID No. 6627	Seq. ID No. 6628
3138	Seq. ID No. 6629	Seq. ID No. 6630
3141	Seq. ID No. 6633	Seq. ID No. 6634
3145c	Seq. ID No. 6639	Seq. ID No. 6640

Listed in Table 19 are the 1534 ORFs detected by the GeneMark™ ORF finder program trained on *Bacillus subtilis* published ORFs.

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1	Seq. ID No. 1	Seq. ID No. 2
2a	Seq. ID No. 3	Seq. ID No. 4
4c	Seq. ID No. 11	Seq. ID No. 12
5	Seq. ID No. 13	Seq. ID No. 14
7	Seq. ID No. 15	Seq. ID No. 16
10	Seq. ID No. 17	Seq. ID No. 18

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
17	Seq. ID No. 25	Seq. ID No. 26
18	Seq. ID No. 27	Seq. ID No. 28
20	Seq. ID No. 29	Seq. ID No. 30
23b	Seq. ID No. 35	Seq. ID No. 36
24	Seq. ID No. 37	Seq. ID No. 38
32	Seq. ID No. 39	Seq. ID No. 40
36	Seq. ID No. 41	Seq. ID No. 42
37	Seq. ID No. 43	Seq. ID No. 44
38a	Seq. ID No. 45	Seq. ID No. 46
39a	Seq. ID No. 49	Seq. ID No. 50
40	Seq. ID No. 53	Seq. ID No. 54
41b	Seq. ID No. 57	Seq. ID No. 58
43b	Seq. ID No. 61	Seq. ID No. 62
45	Seq. ID No. 69	Seq. ID No. 70
46a	Seq. ID No. 71	Seq. ID No. 72
47	Seq. ID No. 75	Seq. ID No. 76
48c	Seq. ID No. 81	Seq. ID No. 82
50	Seq. ID No. 83	Seq. ID No. 84
51c	Seq. ID No. 89	Seq. ID No. 90
57a	Seq. ID No. 95	Seq. ID No. 96
60a	Seq. ID No. 101	Seq. ID No. 102
62c	Seq. ID No. 111	Seq. ID No. 112
65b	Seq. ID No. 119	Seq. ID No. 120
67	Seq. ID No. 125	Seq. ID No. 126
71	Seq. ID No. 129	Seq. ID No. 130
74	Seq. ID No. 135	Seq. ID No. 136
77	Seq. ID No. 137	Seq. ID No. 138
80a	Seq. ID No. 141	Seq. ID No. 142

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
81a	Seq. ID No. 147	Seq. ID No. 148
83	Seq. ID No. 151	Seq. ID No. 152
85b	Seq. ID No. 155	Seq. ID No. 156
88	Seq. ID No. 167	Seq. ID No. 168
91a	Seq. ID No. 171	Seq. ID No. 172
93b	Seq. ID No. 181	Seq. ID No. 182
94	Seq. ID No. 185	Seq. ID No. 186
95b	Seq. ID No. 187	Seq. ID No. 188
97b	Seq. ID No. 189	Seq. ID No. 190
99	Seq. ID No. 191	Seq. ID No. 192
102	Seq. ID No. 195	Seq. ID No. 196
104b	Seq. ID No. 199	Seq. ID No. 200
106	Seq. ID No. 207	Seq. ID No. 208
109c	Seq. ID No. 213	Seq. ID No. 214
111b	Seq. ID No. 219	Seq. ID No. 220
112a	Seq. ID No. 221	Seq. ID No. 222
114	Seq. ID No. 225	Seq. ID No. 226
115	Seq. ID No. 227	Seq. ID No. 228
119a	Seq. ID No. 229	Seq. ID No. 230
121	Seq. ID No. 233	Seq. ID No. 234
124c	Seq. ID No. 239	Seq. ID No. 240
125	Seq. ID No. 241	Seq. ID No. 242
127a	Seq. ID No. 243	Seq. ID No. 244
129c	Seq. ID No. 253	Seq. ID No. 254
134	Seq. ID No. 261	Seq. ID No. 262
135a	Seq. ID No. 263	Seq. ID No. 264
137a	Seq. ID No. 267	Seq. ID No. 268
138b	Seq. ID No. 273	Seq. ID No. 274

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
142	Seq. ID No. 275	Seq. ID No. 276
143	Seq. ID No. 277	Seq. ID No. 278
144a	Seq. ID No. 279	Seq. ID No. 280
145d	Seq. ID No. 291	Seq. ID No. 292
147	Seq. ID No. 293	Seq. ID No. 294
151a	Seq. ID No. 295	Seq. ID No. 296
152a	Seq. ID No. 299	Seq. ID No. 300
153a	Seq. ID No. 303	Seq. ID No. 304
154	Seq. ID No. 309	Seq. ID No. 310
155a	Seq. ID No. 311	Seq. ID No. 312
157a	Seq. ID No. 315	Seq. ID No. 316
158a	Seq. ID No. 319	Seq. ID No. 320
160a	Seq. ID No. 323	Seq. ID No. 324
162c	Seq. ID No. 331	Seq. ID No. 332
165a	Seq. ID No. 341	Seq. ID No. 342
167	Seq. ID No. 345	Seq. ID No. 346
171a	Seq. ID No. 351	Seq. ID No. 352
172	Seq. ID No. 355	Seq. ID No. 356
175	Seq. ID No. 361	Seq. ID No. 362
176	Seq. ID No. 363	Seq. ID No. 364
177a	Seq. ID No. 365	Seq. ID No. 366
180b	Seq. ID No. 375	Seq. ID No. 376
184	Seq. ID No. 379	Seq. ID No. 380
185	Seq. ID No. 381	Seq. ID No. 382
186	Seq. ID No. 383	Seq. ID No. 384
188	Seq. ID No. 389	Seq. ID No. 390
189b	Seq. ID No. 391	Seq. ID No. 392
192a	Seq. ID No. 395	Seq. ID No. 396

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
193	Seq. ID No. 399	Seq. ID No. 400
195	Seq. ID No. 405	Seq. ID No. 406
197a	Seq. ID No. 409	Seq. ID No. 410
198a	Seq. ID No. 413	Seq. ID No. 414
200	Seq. ID No. 417	Seq. ID No. 418
202	Seq. ID No. 421	Seq. ID No. 422
203	Seq. ID No. 423	Seq. ID No. 424
204	Seq. ID No. 425	Seq. ID No. 426
205	Seq. ID No. 427	Seq. ID No. 428
206	Seq. ID No. 429	Seq. ID No. 430
208b	Seq. ID No. 435	Seq. ID No. 436
210	Seq. ID No. 437	Seq. ID No. 438
211	Seq. ID No. 439	Seq. ID No. 440
213	Seq. ID No. 441	Seq. ID No. 442
215a	Seq. ID No. 443	Seq. ID No. 444
218	Seq. ID No. 445	Seq. ID No. 446
219	Seq. ID No. 447	Seq. ID No. 448
220a	Seq. ID No. 449	Seq. ID No. 450
226a	Seq. ID No. 459	Seq. ID No. 460
228a	Seq. ID No. 465	Seq. ID No. 466
236c	Seq. ID No. 485	Seq. ID No. 486
245c	Seq. ID No. 501	Seq. ID No. 502
246b	Seq. ID No. 505	Seq. ID No. 506
248b	Seq. ID No. 511	Seq. ID No. 512
249a	Seq. ID No. 513	Seq. ID No. 514
251	Seq. ID No. 517	Seq. ID No. 518
253a	Seq. ID No. 519	Seq. ID No. 520
254	Seq. ID No. 523	Seq. ID No. 524

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
255c	Seq. ID No. 529	Seq. ID No. 530
258	Seq. ID No. 533	Seq. ID No. 534
259a	Seq. ID No. 535	Seq. ID No. 536
260	Seq. ID No. 541	Seq. ID No. 542
262	Seq. ID No. 543	Seq. ID No. 544
265	Seq. ID No. 551	Seq. ID No. 552
267b	Seq. ID No. 553	Seq. ID No. 554
269a	Seq. ID No. 559	Seq. ID No. 560
271a	Seq. ID No. 563	Seq. ID No. 564
273b	Seq. ID No. 569	Seq. ID No. 570
277c	Seq. ID No. 575	Seq. ID No. 576
279b	Seq. ID No. 579	Seq. ID No. 580
280b	Seq. ID No. 583	Seq. ID No. 584
283a	Seq. ID No. 591	Seq. ID No. 592
284a	Seq. ID No. 595	Seq. ID No. 596
286a	Seq. ID No. 601	Seq. ID No. 602
287	Seq. ID No. 605	Seq. ID No. 606
290a	Seq. ID No. 607	Seq. ID No. 608
293	Seq. ID No. 611	Seq. ID No. 612
294	Seq. ID No. 613	Seq. ID No. 614
296	Seq. ID No. 615	Seq. ID No. 616
301a	Seq. ID No. 621	Seq. ID No. 622
304b	Seq. ID No. 627	Seq. ID No. 628
307	Seq. ID No. 629	Seq. ID No. 630
309	Seq. ID No. 633	Seq. ID No. 634
310	Seq. ID No. 635	Seq. ID No. 636
311	Seq. ID No. 637	Seq. ID No. 638
313c	Seq. ID No. 643	Seq. ID No. 644

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
315	Seq. ID No. 649	Seq. ID No. 650
316a	Seq. ID No. 651	Seq. ID No. 652
317b	Seq. ID No. 655	Seq. ID No. 656
318a	Seq. ID No. 657	Seq. ID No. 658
321	Seq. ID No. 669	Seq. ID No. 670
323a	Seq. ID No. 671	Seq. ID No. 672
324	Seq. ID No. 675	Seq. ID No. 676
327c	Seq. ID No. 681	Seq. ID No. 682
329	Seq. ID No. 683	Seq. ID No. 684
330a	Seq. ID No. 685	Seq. ID No. 686
332	Seq. ID No. 693	Seq. ID No. 694
337	Seq. ID No. 703	Seq. ID No. 704
338a	Seq. ID No. 705	Seq. ID No. 706
341a	Seq. ID No. 711	Seq. ID No. 712
342f	Seq. ID No. 725	Seq. ID No. 726
344a	Seq. ID No. 731	Seq. ID No. 732
345	Seq. ID No. 735	Seq. ID No. 736
346a	Seq. ID No. 737	Seq. ID No. 738
347	Seq. ID No. 741	Seq. ID No. 742
349a	Seq. ID No. 743	Seq. ID No. 744
350a	Seq. ID No. 749	Seq. ID No. 750
351	Seq. ID No. 753	Seq. ID No. 754
352c	Seq. ID No. 759	Seq. ID No. 760
356c	Seq. ID No. 773	Seq. ID No. 774
358c	Seq. ID No. 781	Seq. ID No. 782
362	Seq. ID No. 783	Seq. ID No. 784
365a	Seq. ID No. 785	Seq. ID No. 786
366b	Seq. ID No. 789	Seq. ID No. 790



**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
367a	Seq. ID No. 793	Seq. ID No. 794
371a	Seq. ID No. 797	Seq. ID No. 798
372b	Seq. ID No. 803	Seq. ID No. 804
378a	Seq. ID No. 815	Seq. ID No. 816
382b	Seq. ID No. 819	Seq. ID No. 820
383a	Seq. ID No. 821	Seq. ID No. 822
384b	Seq. ID No. 827	Seq. ID No. 828
385b	Seq. ID No. 831	Seq. ID No. 832
386	Seq. ID No. 833	Seq. ID No. 834
387	Seq. ID No. 835	Seq. ID No. 836
390	Seq. ID No. 837	Seq. ID No. 838
393b	Seq. ID No. 841	Seq. ID No. 842
395a	Seq. ID No. 843	Seq. ID No. 844
396	Seq. ID No. 849	Seq. ID No. 850
398	Seq. ID No. 851	Seq. ID No. 852
400a	Seq. ID No. 853	Seq. ID No. 854
401a	Seq. ID No. 857	Seq. ID No. 858
403c	Seq. ID No. 865	Seq. ID No. 866
406a	Seq. ID No. 869	Seq. ID No. 870
409a	Seq. ID No. 873	Seq. ID No. 874
410a	Seq. ID No. 877	Seq. ID No. 878
413a	Seq. ID No. 883	Seq. ID No. 884
416a	Seq. ID No. 887	Seq. ID No. 888
417	Seq. ID No. 891	Seq. ID No. 892
418b	Seq. ID No. 895	Seq. ID No. 896
419c	Seq. ID No. 901	Seq. ID No. 902
421	Seq. ID No. 907	Seq. ID No. 908
424a	Seq. ID No. 911	Seq. ID No. 912

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
426a	Seq. ID No. 917	Seq. ID No. 918
427a	Seq. ID No. 921	Seq. ID No. 922
429a	Seq. ID No. 927	Seq. ID No. 928
431	Seq. ID No. 935	Seq. ID No. 936
435	Seq. ID No. 939	Seq. ID No. 940
438a	Seq. ID No. 945	Seq. ID No. 946
440	Seq. ID No. 951	Seq. ID No. 952
441a	Seq. ID No. 953	Seq. ID No. 954
444a	Seq. ID No. 959	Seq. ID No. 960
445a	Seq. ID No. 963	Seq. ID No. 964
448	Seq. ID No. 967	Seq. ID No. 968
450a	Seq. ID No. 969	Seq. ID No. 970
452a	Seq. ID No. 977	Seq. ID No. 978
455a	Seq. ID No. 989	Seq. ID No. 990
458a	Seq. ID No. 995	Seq. ID No. 996
460a	Seq. ID No. 999	Seq. ID No. 1000
462	Seq. ID No. 1005	Seq. ID No. 1006
463a	Seq. ID No. 1007	Seq. ID No. 1008
464c	Seq. ID No. 1015	Seq. ID No. 1016
467a	Seq. ID No. 1021	Seq. ID No. 1022
472d	Seq. ID No. 1035	Seq. ID No. 1036
473	Seq. ID No. 1041	Seq. ID No. 1042
474	Seq. ID No. 1043	Seq. ID No. 1044
478a	Seq. ID No. 1049	Seq. ID No. 1050
479	Seq. ID No. 1053	Seq. ID No. 1054
480b	Seq. ID No. 1057	Seq. ID No. 1058
481a	Seq. ID No. 1059	Seq. ID No. 1060
482a	Seq. ID No. 1063	Seq. ID No. 1064

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
483	Seq. ID No. 1067	Seq. ID No. 1068
490	Seq. ID No. 1069	Seq. ID No. 1070
491a	Seq. ID No. 1071	Seq. ID No. 1072
492	Seq. ID No. 1075	Seq. ID No. 1076
495c	Seq. ID No. 1083	Seq. ID No. 1084
498a	Seq. ID No. 1085	Seq. ID No. 1086
499a	Seq. ID No. 1089	Seq. ID No. 1090
500	Seq. ID No. 1093	Seq. ID No. 1094
502c	Seq. ID No. 1097	Seq. ID No. 1098
504	Seq. ID No. 1099	Seq. ID No. 1100
505a	Seq. ID No. 1101	Seq. ID No. 1102
509	Seq. ID No. 1109	Seq. ID No. 1110
512a	Seq. ID No. 1113	Seq. ID No. 1114
514	Seq. ID No. 1117	Seq. ID No. 1118
515b	Seq. ID No. 1121	Seq. ID No. 1122
518c	Seq. ID No. 1129	Seq. ID No. 1130
523	Seq. ID No. 1133	Seq. ID No. 1134
524b	Seq. ID No. 1137	Seq. ID No. 1138
527a	Seq. ID No. 1141	Seq. ID No. 1142
528a	Seq. ID No. 1145	Seq. ID No. 1146
529	Seq. ID No. 1149	Seq. ID No. 1150
533	Seq. ID No. 1155	Seq. ID No. 1156
535	Seq. ID No. 1157	Seq. ID No. 1158
536	Seq. ID No. 1159	Seq. ID No. 1160
539c	Seq. ID No. 1163	Seq. ID No. 1164
541d	Seq. ID No. 1171	Seq. ID No. 1172
542	Seq. ID No. 1173	Seq. ID No. 1174
543a	Seq. ID No. 1175	Seq. ID No. 1176

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
544	Seq. ID No. 1181	Seq. ID No. 1182
545b	Seq. ID No. 1185	Seq. ID No. 1186
546a	Seq. ID No. 1189	Seq. ID No. 1190
548	Seq. ID No. 1199	Seq. ID No. 1200
551	Seq. ID No. 1205	Seq. ID No. 1206
554a	Seq. ID No. 1209	Seq. ID No. 1210
557a	Seq. ID No. 1215	Seq. ID No. 1216
560a	Seq. ID No. 1219	Seq. ID No. 1220
561	Seq. ID No. 1223	Seq. ID No. 1224
563	Seq. ID No. 1225	Seq. ID No. 1226
569	Seq. ID No. 1233	Seq. ID No. 1234
570a	Seq. ID No. 1235	Seq. ID No. 1236
573	Seq. ID No. 1241	Seq. ID No. 1242
580a	Seq. ID No. 1251	Seq. ID No. 1252
583a	Seq. ID No. 1255	Seq. ID No. 1256
586a	Seq. ID No. 1261	Seq. ID No. 1262
587d	Seq. ID No. 1271	Seq. ID No. 1272
590	Seq. ID No. 1281	Seq. ID No. 1282
609a	Seq. ID No. 1315	Seq. ID No. 1316
611	Seq. ID No. 1323	Seq. ID No. 1324
613d	Seq. ID No. 1331	Seq. ID No. 1332
614a	Seq. ID No. 1333	Seq. ID No. 1334
618	Seq. ID No. 1339	Seq. ID No. 1340
620	Seq. ID No. 1345	Seq. ID No. 1346
623	Seq. ID No. 1347	Seq. ID No. 1348
625	Seq. ID No. 1355	Seq. ID No. 1356
626a	Seq. ID No. 1357	Seq. ID No. 1358
631d	Seq. ID No. 1369	Seq. ID No. 1370

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
633a	Seq. ID No. 1373	Seq. ID No. 1374
637c	Seq. ID No. 1387	Seq. ID No. 1388
641a	Seq. ID No. 1391	Seq. ID No. 1392
643	Seq. ID No. 1395	Seq. ID No. 1396
644a	Seq. ID No. 1397	Seq. ID No. 1398
650	Seq. ID No. 1403	Seq. ID No. 1404
652	Seq. ID No. 1405	Seq. ID No. 1406
653a	Seq. ID No. 1407	Seq. ID No. 1408
656	Seq. ID No. 1413	Seq. ID No. 1414
657c	Seq. ID No. 1415	Seq. ID No. 1416
658a	Seq. ID No. 1417	Seq. ID No. 1418
661	Seq. ID No. 1425	Seq. ID No. 1426
663	Seq. ID No. 1427	Seq. ID No. 1428
665	Seq. ID No. 1429	Seq. ID No. 1430
666	Seq. ID No. 1431	Seq. ID No. 1432
670	Seq. ID No. 1433	Seq. ID No. 1434
674a	Seq. ID No. 1435	Seq. ID No. 1436
676	Seq. ID No. 1439	Seq. ID No. 1440
677a	Seq. ID No. 1441	Seq. ID No. 1442
681	Seq. ID No. 1451	Seq. ID No. 1452
683a	Seq. ID No. 1453	Seq. ID No. 1454
687	Seq. ID No. 1459	Seq. ID No. 1460
688a	Seq. ID No. 1461	Seq. ID No. 1462
691b	Seq. ID No. 1469	Seq. ID No. 1470
692	Seq. ID No. 1471	Seq. ID No. 1472
694	Seq. ID No. 1473	Seq. ID No. 1474
696	Seq. ID No. 1475	Seq. ID No. 1476
698	Seq. ID No. 1477	Seq. ID No. 1478

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
700b	Seq. ID No. 1483	Seq. ID No. 1484
703	Seq. ID No. 1487	Seq. ID No. 1488
705a	Seq. ID No. 1489	Seq. ID No. 1490
707	Seq. ID No. 1493	Seq. ID No. 1494
709	Seq. ID No. 1495	Seq. ID No. 1496
710	Seq. ID No. 1497	Seq. ID No. 1498
712b	Seq. ID No. 1501	Seq. ID No. 1502
715a	Seq. ID No. 1503	Seq. ID No. 1504
717	Seq. ID No. 1507	Seq. ID No. 1508
718a	Seq. ID No. 1509	Seq. ID No. 1510
722c	Seq. ID No. 1517	Seq. ID No. 1518
724b	Seq. ID No. 1521	Seq. ID No. 1522
726	Seq. ID No. 1527	Seq. ID No. 1528
728b	Seq. ID No. 1531	Seq. ID No. 1532
730c	Seq. ID No. 1537	Seq. ID No. 1538
731b	Seq. ID No. 1541	Seq. ID No. 1542
732	Seq. ID No. 1543	Seq. ID No. 1544
738c	Seq. ID No. 1549	Seq. ID No. 1550
743b	Seq. ID No. 1561	Seq. ID No. 1562
744	Seq. ID No. 1563	Seq. ID No. 1564
745a	Seq. ID No. 1565	Seq. ID No. 1566
746a	Seq. ID No. 1569	Seq. ID No. 1570
747	Seq. ID No. 1573	Seq. ID No. 1574
748a	Seq. ID No. 1575	Seq. ID No. 1576
751	Seq. ID No. 1581	Seq. ID No. 1582
754c	Seq. ID No. 1587	Seq. ID No. 1588
756a	Seq. ID No. 1591	Seq. ID No. 1592
758	Seq. ID No. 1595	Seq. ID No. 1596

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
760	Seq. ID No. 1597	Seq. ID No. 1598
763a	Seq. ID No. 1605	Seq. ID No. 1606
764	Seq. ID No. 1609	Seq. ID No. 1610
767	Seq. ID No. 1613	Seq. ID No. 1614
770c	Seq. ID No. 1619	Seq. ID No. 1620
772b	Seq. ID No. 1623	Seq. ID No. 1624
775	Seq. ID No. 1627	Seq. ID No. 1628
777a	Seq. ID No. 1629	Seq. ID No. 1630
780a	Seq. ID No. 1635	Seq. ID No. 1636
785	Seq. ID No. 1641	Seq. ID No. 1642
788b	Seq. ID No. 1647	Seq. ID No. 1648
789b	Seq. ID No. 1651	Seq. ID No. 1652
792	Seq. ID No. 1657	Seq. ID No. 1658
794a	Seq. ID No. 1659	Seq. ID No. 1660
795	Seq. ID No. 1667	Seq. ID No. 1668
797	Seq. ID No. 1669	Seq. ID No. 1670
799e	Seq. ID No. 1679	Seq. ID No. 1680
803a	Seq. ID No. 1683	Seq. ID No. 1684
804a	Seq. ID No. 1687	Seq. ID No. 1688
807	Seq. ID No. 1691	Seq. ID No. 1692
812	Seq. ID No. 1697	Seq. ID No. 1698
813	Seq. ID No. 1699	Seq. ID No. 1700
816	Seq. ID No. 1701	Seq. ID No. 1702
826	Seq. ID No. 1707	Seq. ID No. 1708
829a	Seq. ID No. 1709	Seq. ID No. 1710
830	Seq. ID No. 1713	Seq. ID No. 1714
834b	Seq. ID No. 1717	Seq. ID No. 1718
835a	Seq. ID No. 1721	Seq. ID No. 1722

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
836a	Seq. ID No. 1725	Seq. ID No. 1726
837c	Seq. ID No. 1735	Seq. ID No. 1736
843	Seq. ID No. 1737	Seq. ID No. 1738
847a	Seq. ID No. 1739	Seq. ID No. 1740
848	Seq. ID No. 1743	Seq. ID No. 1744
849a	Seq. ID No. 1745	Seq. ID No. 1746
851a	Seq. ID No. 1749	Seq. ID No. 1750
853b	Seq. ID No. 1755	Seq. ID No. 1756
859c	Seq. ID No. 1769	Seq. ID No. 1770
860	Seq. ID No. 1773	Seq. ID No. 1774
863	Seq. ID No. 1777	Seq. ID No. 1778
866b	Seq. ID No. 1785	Seq. ID No. 1786
868b	Seq. ID No. 1789	Seq. ID No. 1790
870	Seq. ID No. 1791	Seq. ID No. 1792
873c	Seq. ID No. 1797	Seq. ID No. 1798
874a	Seq. ID No. 1799	Seq. ID No. 1800
875	Seq. ID No. 1803	Seq. ID No. 1804
876	Seq. ID No. 1805	Seq. ID No. 1806
878a	Seq. ID No. 1807	Seq. ID No. 1808
880c	Seq. ID No. 1817	Seq. ID No. 1818
885	Seq. ID No. 1819	Seq. ID No. 1820
886	Seq. ID No. 1821	Seq. ID No. 1822
888	Seq. ID No. 1825	Seq. ID No. 1826
890a	Seq. ID No. 1827	Seq. ID No. 1828
894	Seq. ID No. 1831	Seq. ID No. 1832
907a	Seq. ID No. 1835	Seq. ID No. 1836
908b	Seq. ID No. 1841	Seq. ID No. 1842
911	Seq. ID No. 1845	Seq. ID No. 1846



**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
912	Seq. ID No. 1847	Seq. ID No. 1848
916	Seq. ID No. 1849	Seq. ID No. 1850
917	Seq. ID No. 1851	Seq. ID No. 1852
918c	Seq. ID No. 1855	Seq. ID No. 1856
923	Seq. ID No. 1859	Seq. ID No. 1860
925a	Seq. ID No. 1861	Seq. ID No. 1862
926	Seq. ID No. 1865	Seq. ID No. 1866
927	Seq. ID No. 1867	Seq. ID No. 1868
929b	Seq. ID No. 1871	Seq. ID No. 1872
930	Seq. ID No. 1873	Seq. ID No. 1874
932	Seq. ID No. 1877	Seq. ID No. 1878
934a	Seq. ID No. 1879	Seq. ID No. 1880
935	Seq. ID No. 1887	Seq. ID No. 1888
938	Seq. ID No. 1889	Seq. ID No. 1890
939c	Seq. ID No. 1895	Seq. ID No. 1896
942	Seq. ID No. 1897	Seq. ID No. 1898
943	Seq. ID No. 1899	Seq. ID No. 1900
944a	Seq. ID No. 1901	Seq. ID No. 1902
946	Seq. ID No. 1905	Seq. ID No. 1906
949b	Seq. ID No. 1909	Seq. ID No. 1910
951a	Seq. ID No. 1917	Seq. ID No. 1918
952a	Seq. ID No. 1921	Seq. ID No. 1922
954	Seq. ID No. 1925	Seq. ID No. 1926
956	Seq. ID No. 1931	Seq. ID No. 1932
958a	Seq. ID No. 1933	Seq. ID No. 1934
959	Seq. ID No. 1937	Seq. ID No. 1938
961a	Seq. ID No. 1939	Seq. ID No. 1940
963	Seq. ID No. 1945	Seq. ID No. 1946

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
965a	Seq. ID No. 1947	Seq. ID No. 1948
966a	Seq. ID No. 1951	Seq. ID No. 1952
967a	Seq. ID No. 1955	Seq. ID No. 1956
968	Seq. ID No. 1959	Seq. ID No. 1960
969	Seq. ID No. 1961	Seq. ID No. 1962
972b	Seq. ID No. 1965	Seq. ID No. 1966
976	Seq. ID No. 1967	Seq. ID No. 1968
977a	Seq. ID No. 1969	Seq. ID No. 1970
978a	Seq. ID No. 1973	Seq. ID No. 1974
979	Seq. ID No. 1977	Seq. ID No. 1978
980	Seq. ID No. 1979	Seq. ID No. 1980
982	Seq. ID No. 1983	Seq. ID No. 1984
986	Seq. ID No. 1989	Seq. ID No. 1990
987	Seq. ID No. 1991	Seq. ID No. 1992
988c	Seq. ID No. 1997	Seq. ID No. 1998
991	Seq. ID No. 2001	Seq. ID No. 2002
992	Seq. ID No. 2003	Seq. ID No. 2004
997	Seq. ID No. 2011	Seq. ID No. 2012
1000	Seq. ID No. 2021	Seq. ID No. 2022
1001	Seq. ID No. 2023	Seq. ID No. 2024
1004a	Seq. ID No. 2029	Seq. ID No. 2030
1006a	Seq. ID No. 2033	Seq. ID No. 2034
1007	Seq. ID No. 2037	Seq. ID No. 2038
1012	Seq. ID No. 2039	Seq. ID No. 2040
1013c	Seq. ID No. 2045	Seq. ID No. 2046
1016c	Seq. ID No. 2047	Seq. ID No. 2048
1017b	Seq. ID No. 2051	Seq. ID No. 2052
1018a	Seq. ID No. 2057	Seq. ID No. 2058

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1021a	Seq. ID No. 2061	Seq. ID No. 2062
1024	Seq. ID No. 2067	Seq. ID No. 2068
1025	Seq. ID No. 2069	Seq. ID No. 2070
1026	Seq. ID No. 2071	Seq. ID No. 2072
1029	Seq. ID No. 2073	Seq. ID No. 2074
1033b	Seq. ID No. 2077	Seq. ID No. 2078
1036b	Seq. ID No. 2089	Seq. ID No. 2090
1037	Seq. ID No. 2093	Seq. ID No. 2094
1039a	Seq. ID No. 2095	Seq. ID No. 2096
1041	Seq. ID No. 2099	Seq. ID No. 2100
1042a	Seq. ID No. 2101	Seq. ID No. 2102
1047a	Seq. ID No. 2113	Seq. ID No. 2114
1049a	Seq. ID No. 2117	Seq. ID No. 2118
1050b	Seq. ID No. 2123	Seq. ID No. 2124
1057	Seq. ID No. 2135	Seq. ID No. 2136
1058	Seq. ID No. 2137	Seq. ID No. 2138
1060a	Seq. ID No. 2139	Seq. ID No. 2140
1062	Seq. ID No. 2143	Seq. ID No. 2144
1064	Seq. ID No. 2147	Seq. ID No. 2148
1065c	Seq. ID No. 2153	Seq. ID No. 2154
1067	Seq. ID No. 2159	Seq. ID No. 2160
1070a	Seq. ID No. 2163	Seq. ID No. 2164
1076a	Seq. ID No. 2167	Seq. ID No. 2168
1077c	Seq. ID No. 2175	Seq. ID No. 2176
1079a	Seq. ID No. 2181	Seq. ID No. 2182
1080a	Seq. ID No. 2185	Seq. ID No. 2186
1081b	Seq. ID No. 2189	Seq. ID No. 2190
1085	Seq. ID No. 2193	Seq. ID No. 2194

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1086	Seq. ID No. 2195	Seq. ID No. 2196
1087a	Seq. ID No. 2197	Seq. ID No. 2198
1094a	Seq. ID No. 2205	Seq. ID No. 2206
1096c	Seq. ID No. 2217	Seq. ID No. 2218
1097	Seq. ID No. 2219	Seq. ID No. 2220
1100	Seq. ID No. 2223	Seq. ID No. 2224
1101a	Seq. ID No. 2225	Seq. ID No. 2226
1104	Seq. ID No. 2229	Seq. ID No. 2230
1108b	Seq. ID No. 2235	Seq. ID No. 2236
1111b	Seq. ID No. 2239	Seq. ID No. 2240
1112a	Seq. ID No. 2243	Seq. ID No. 2244
1125	Seq. ID No. 2245	Seq. ID No. 2246
1126a	Seq. ID No. 2247	Seq. ID No. 2248
1127	Seq. ID No. 2253	Seq. ID No. 2254
1128	Seq. ID No. 2255	Seq. ID No. 2256
1131	Seq. ID No. 2257	Seq. ID No. 2258
1132	Seq. ID No. 2259	Seq. ID No. 2260
1135a	Seq. ID No. 2261	Seq. ID No. 2262
1136a	Seq. ID No. 2265	Seq. ID No. 2266
1138	Seq. ID No. 2269	Seq. ID No. 2270
1140b	Seq. ID No. 2273	Seq. ID No. 2274
1144b	Seq. ID No. 2285	Seq. ID No. 2286
1146e	Seq. ID No. 2297	Seq. ID No. 2298
1148	Seq. ID No. 2299	Seq. ID No. 2300
1149	Seq. ID No. 2301	Seq. ID No. 2302
1152f	Seq. ID No. 2313	Seq. ID No. 2314
1155f	Seq. ID No. 2327	Seq. ID No. 2328
1158a	Seq. ID No. 2331	Seq. ID No. 2332

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1160	Seq. ID No. 2335	Seq. ID No. 2336
1161a	Seq. ID No. 2337	Seq. ID No. 2338
1162	Seq. ID No. 2341	Seq. ID No. 2342
1165	Seq. ID No. 2343	Seq. ID No. 2344
1166	Seq. ID No. 2345	Seq. ID No. 2346
1167b	Seq. ID No. 2349	Seq. ID No. 2350
1168	Seq. ID No. 2351	Seq. ID No. 2352
1169c	Seq. ID No. 2357	Seq. ID No. 2358
1170	Seq. ID No. 2359	Seq. ID No. 2360
1171a	Seq. ID No. 2361	Seq. ID No. 2362
1172	Seq. ID No. 2365	Seq. ID No. 2366
1174	Seq. ID No. 2369	Seq. ID No. 2370
1177	Seq. ID No. 2373	Seq. ID No. 2374
1179a	Seq. ID No. 2377	Seq. ID No. 2378
1180a	Seq. ID No. 2383	Seq. ID No. 2384
1183a	Seq. ID No. 2397	Seq. ID No. 2398
1184	Seq. ID No. 2401	Seq. ID No. 2402
1185a	Seq. ID No. 2403	Seq. ID No. 2404
1186b	Seq. ID No. 2409	Seq. ID No. 2410
1188a	Seq. ID No. 2411	Seq. ID No. 2412
1191	Seq. ID No. 2417	Seq. ID No. 2418
1192b	Seq. ID No. 2421	Seq. ID No. 2422
1194	Seq. ID No. 2423	Seq. ID No. 2424
1196a	Seq. ID No. 2425	Seq. ID No. 2426
1197	Seq. ID No. 2429	Seq. ID No. 2430
1199b	Seq. ID No. 2435	Seq. ID No. 2436
1200	Seq. ID No. 2437	Seq. ID No. 2438
1201	Seq. ID No. 2439	Seq. ID No. 2440

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1202a	Seq. ID No. 2441	Seq. ID No. 2442
1205	Seq. ID No. 2445	Seq. ID No. 2446
1207	Seq. ID No. 2449	Seq. ID No. 2450
1208	Seq. ID No. 2451	Seq. ID No. 2452
1209	Seq. ID No. 2453	Seq. ID No. 2454
1213a	Seq. ID No. 2461	Seq. ID No. 2462
1214	Seq. ID No. 2465	Seq. ID No. 2466
1215a	Seq. ID No. 2467	Seq. ID No. 2468
1217c	Seq. ID No. 2471	Seq. ID No. 2472
1218a	Seq. ID No. 2473	Seq. ID No. 2474
1219	Seq. ID No. 2477	Seq. ID No. 2478
1220	Seq. ID No. 2479	Seq. ID No. 2480
1221a	Seq. ID No. 2481	Seq. ID No. 2482
1223	Seq. ID No. 2485	Seq. ID No. 2486
1224a	Seq. ID No. 2487	Seq. ID No. 2488
1226	Seq. ID No. 2495	Seq. ID No. 2496
1230	Seq. ID No. 2505	Seq. ID No. 2506
1231	Seq. ID No. 2507	Seq. ID No. 2508
1233a	Seq. ID No. 2509	Seq. ID No. 2510
1234c	Seq. ID No. 2519	Seq. ID No. 2520
1237	Seq. ID No. 2525	Seq. ID No. 2526
1239	Seq. ID No. 2527	Seq. ID No. 2528
1240	Seq. ID No. 2529	Seq. ID No. 2530
1241c	Seq. ID No. 2535	Seq. ID No. 2536
1243	Seq. ID No. 2537	Seq. ID No. 2538
1244	Seq. ID No. 2539	Seq. ID No. 2540
1245d	Seq. ID No. 2547	Seq. ID No. 2548
1246a	Seq. ID No. 2551	Seq. ID No. 2552

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1250e	Seq. ID No. 2563	Seq. ID No. 2564
1251a	Seq. ID No. 2565	Seq. ID No. 2566
1253c	Seq. ID No. 2573	Seq. ID No. 2574
1256	Seq. ID No. 2577	Seq. ID No. 2578
1257a	Seq. ID No. 2579	Seq. ID No. 2580
1258b	Seq. ID No. 2585	Seq. ID No. 2586
1263	Seq. ID No. 2593	Seq. ID No. 2594
1265	Seq. ID No. 2595	Seq. ID No. 2596
1266b	Seq. ID No. 2599	Seq. ID No. 2600
1268b	Seq. ID No. 2607	Seq. ID No. 2608
1269	Seq. ID No. 2609	Seq. ID No. 2610
1271	Seq. ID No. 2613	Seq. ID No. 2614
1272a	Seq. ID No. 2615	Seq. ID No. 2616
1273	Seq. ID No. 2619	Seq. ID No. 2620
1275b	Seq. ID No. 2623	Seq. ID No. 2624
1277	Seq. ID No. 2625	Seq. ID No. 2626
1279	Seq. ID No. 2631	Seq. ID No. 2632
1281	Seq. ID No. 2633	Seq. ID No. 2634
1283c	Seq. ID No. 2639	Seq. ID No. 2640
1284	Seq. ID No. 2641	Seq. ID No. 2642
1285a	Seq. ID No. 2643	Seq. ID No. 2644
1287a	Seq. ID No. 2647	Seq. ID No. 2648
1288	Seq. ID No. 2651	Seq. ID No. 2652
1290	Seq. ID No. 2655	Seq. ID No. 2656
1293a	Seq. ID No. 2657	Seq. ID No. 2658
1294a	Seq. ID No. 2661	Seq. ID No. 2662
1297a	Seq. ID No. 2665	Seq. ID No. 2666
1300	Seq. ID No. 2669	Seq. ID No. 2670

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1302	Seq. ID No. 2671	Seq. ID No. 2672
1305a	Seq. ID No. 2673	Seq. ID No. 2674
1308b	Seq. ID No. 2681	Seq. ID No. 2682
1311	Seq. ID No. 2689	Seq. ID No. 2690
1315	Seq. ID No. 2693	Seq. ID No. 2694
1318	Seq. ID No. 2699	Seq. ID No. 2700
1319b	Seq. ID No. 2703	Seq. ID No. 2704
1320c	Seq. ID No. 2709	Seq. ID No. 2710
1321	Seq. ID No. 2711	Seq. ID No. 2712
1322a	Seq. ID No. 2713	Seq. ID No. 2714
1324	Seq. ID No. 2719	Seq. ID No. 2720
1326a	Seq. ID No. 2721	Seq. ID No. 2722
1333	Seq. ID No. 2727	Seq. ID No. 2728
1337	Seq. ID No. 2737	Seq. ID No. 2738
1340a	Seq. ID No. 2741	Seq. ID No. 2742
1341a	Seq. ID No. 2745	Seq. ID No. 2746
1344a	Seq. ID No. 2749	Seq. ID No. 2750
1348	Seq. ID No. 2753	Seq. ID No. 2754
1349b	Seq. ID No. 2757	Seq. ID No. 2758
1350a	Seq. ID No. 2761	Seq. ID No. 2762
1353	Seq. ID No. 2765	Seq. ID No. 2766
1355	Seq. ID No. 2767	Seq. ID No. 2768
1358a	Seq. ID No. 2769	Seq. ID No. 2770
1359	Seq. ID No. 2773	Seq. ID No. 2774
1361	Seq. ID No. 2775	Seq. ID No. 2776
1364a	Seq. ID No. 2777	Seq. ID No. 2778
1366b	Seq. ID No. 2787	Seq. ID No. 2788
1367	Seq. ID No. 2789	Seq. ID No. 2790



**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1368	Seq. ID No. 2791	Seq. ID No. 2792
1371	Seq. ID No. 2793	Seq. ID No. 2794
1373a	Seq. ID No. 2795	Seq. ID No. 2796
1374	Seq. ID No. 2799	Seq. ID No. 2800
1377	Seq. ID No. 2803	Seq. ID No. 2804
1382	Seq. ID No. 2815	Seq. ID No. 2816
1383	Seq. ID No. 2817	Seq. ID No. 2818
1384a	Seq. ID No. 2819	Seq. ID No. 2820
1386a	Seq. ID No. 2825	Seq. ID No. 2826
1394	Seq. ID No. 2843	Seq. ID No. 2844
1396	Seq. ID No. 2847	Seq. ID No. 2848
1397	Seq. ID No. 2849	Seq. ID No. 2850
1398	Seq. ID No. 2851	Seq. ID No. 2852
1400	Seq. ID No. 2857	Seq. ID No. 2858
1401	Seq. ID No. 2859	Seq. ID No. 2860
1405	Seq. ID No. 2863	Seq. ID No. 2864
1408	Seq. ID No. 2867	Seq. ID No. 2868
1409	Seq. ID No. 2869	Seq. ID No. 2870
1410	Seq. ID No. 2871	Seq. ID No. 2872
1411c	Seq. ID No. 2877	Seq. ID No. 2878
1412a	Seq. ID No. 2879	Seq. ID No. 2880
1415	Seq. ID No. 2889	Seq. ID No. 2890
1416	Seq. ID No. 2891	Seq. ID No. 2892
1420a	Seq. ID No. 2897	Seq. ID No. 2898
1422	Seq. ID No. 2901	Seq. ID No. 2902
1423	Seq. ID No. 2903	Seq. ID No. 2904
1426b	Seq. ID No. 2907	Seq. ID No. 2908
1427a	Seq. ID No. 2909	Seq. ID No. 2910

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1428	Seq. ID No. 2913	Seq. ID No. 2914
1429a	Seq. ID No. 2915	Seq. ID No. 2916
1431	Seq. ID No. 2919	Seq. ID No. 2920
1432	Seq. ID No. 2921	Seq. ID No. 2922
1433	Seq. ID No. 2923	Seq. ID No. 2924
1434a	Seq. ID No. 2925	Seq. ID No. 2926
1437a	Seq. ID No. 2929	Seq. ID No. 2930
1438	Seq. ID No. 2935	Seq. ID No. 2936
1439d	Seq. ID No. 2943	Seq. ID No. 2944
1440c	Seq. ID No. 2951	Seq. ID No. 2952
1442a	Seq. ID No. 2955	Seq. ID No. 2956
1445c	Seq. ID No. 2963	Seq. ID No. 2964
1446a	Seq. ID No. 2965	Seq. ID No. 2966
1447b	Seq. ID No. 2971	Seq. ID No. 2972
1448	Seq. ID No. 2973	Seq. ID No. 2974
1449a	Seq. ID No. 2975	Seq. ID No. 2976
1451	Seq. ID No. 2979	Seq. ID No. 2980
1452a	Seq. ID No. 2981	Seq. ID No. 2982
1453	Seq. ID No. 2985	Seq. ID No. 2986
1455a	Seq. ID No. 2989	Seq. ID No. 2990
1456	Seq. ID No. 2993	Seq. ID No. 2994
1457c	Seq. ID No. 2999	Seq. ID No. 3000
1459	Seq. ID No. 3001	Seq. ID No. 3002
1462a	Seq. ID No. 3003	Seq. ID No. 3004
1466c	Seq. ID No. 3017	Seq. ID No. 3018
1469c	Seq. ID No. 3027	Seq. ID No. 3028
1470c	Seq. ID No. 3033	Seq. ID No. 3034
1471	Seq. ID No. 3035	Seq. ID No. 3036

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1472c	Seq. ID No. 3039	Seq. ID No. 3040
1474	Seq. ID No. 3041	Seq. ID No. 3042
1475	Seq. ID No. 3043	Seq. ID No. 3044
1476	Seq. ID No. 3045	Seq. ID No. 3046
1477a	Seq. ID No. 3047	Seq. ID No. 3048
1479c	Seq. ID No. 3055	Seq. ID No. 3056
1482a	Seq. ID No. 3057	Seq. ID No. 3058
1483	Seq. ID No. 3061	Seq. ID No. 3062
1484b	Seq. ID No. 3065	Seq. ID No. 3066
1486	Seq. ID No. 3069	Seq. ID No. 3070
1488d	Seq. ID No. 3079	Seq. ID No. 3080
1490	Seq. ID No. 3089	Seq. ID No. 3090
1494	Seq. ID No. 3091	Seq. ID No. 3092
1497	Seq. ID No. 3093	Seq. ID No. 3094
1498a	Seq. ID No. 3095	Seq. ID No. 3096
1499	Seq. ID No. 3103	Seq. ID No. 3104
1502a	Seq. ID No. 3105	Seq. ID No. 3106
1503a	Seq. ID No. 3109	Seq. ID No. 3110
1506a	Seq. ID No. 3113	Seq. ID No. 3114
1508	Seq. ID No. 3125	Seq. ID No. 3126
1510a	Seq. ID No. 3127	Seq. ID No. 3128
1511	Seq. ID No. 3135	Seq. ID No. 3136
1512	Seq. ID No. 3137	Seq. ID No. 3138
1513b	Seq. ID No. 3141	Seq. ID No. 3142
1516	Seq. ID No. 3143	Seq. ID No. 3144
1517b	Seq. ID No. 3147	Seq. ID No. 3148
1520	Seq. ID No. 3155	Seq. ID No. 3156
1522	Seq. ID No. 3157	Seq. ID No. 3158

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1523	Seq. ID No. 3159	Seq. ID No. 3160
1528	Seq. ID No. 3161	Seq. ID No. 3162
1530b	Seq. ID No. 3165	Seq. ID No. 3166
1534a	Seq. ID No. 3169	Seq. ID No. 3170
1536a	Seq. ID No. 3175	Seq. ID No. 3176
1537	Seq. ID No. 3179	Seq. ID No. 3180
1543	Seq. ID No. 3183	Seq. ID No. 3184
1544	Seq. ID No. 3185	Seq. ID No. 3186
1547b	Seq. ID No. 3189	Seq. ID No. 3190
1548	Seq. ID No. 3191	Seq. ID No. 3192
1553a	Seq. ID No. 3195	Seq. ID No. 3196
1554a	Seq. ID No. 3199	Seq. ID No. 3200
1555	Seq. ID No. 3205	Seq. ID No. 3206
1556c	Seq. ID No. 3211	Seq. ID No. 3212
1557c	Seq. ID No. 3217	Seq. ID No. 3218
1559b	Seq. ID No. 3221	Seq. ID No. 3222
1564a	Seq. ID No. 3225	Seq. ID No. 3226
1565	Seq. ID No. 3229	Seq. ID No. 3230
1567	Seq. ID No. 3231	Seq. ID No. 3232
1570	Seq. ID No. 3237	Seq. ID No. 3238
1571	Seq. ID No. 3239	Seq. ID No. 3240
1572d	Seq. ID No. 3247	Seq. ID No. 3248
1573	Seq. ID No. 3251	Seq. ID No. 3252
1576	Seq. ID No. 3253	Seq. ID No. 3254
1577a	Seq. ID No. 3255	Seq. ID No. 3256
1578	Seq. ID No. 3259	Seq. ID No. 3260
1580a	Seq. ID No. 3261	Seq. ID No. 3262
1582a	Seq. ID No. 3267	Seq. ID No. 3268

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1584	Seq. ID No. 3273	Seq. ID No. 3274
1585b	Seq. ID No. 3277	Seq. ID No. 3278
1587a	Seq. ID No. 3279	Seq. ID No. 3280
1588	Seq. ID No. 3285	Seq. ID No. 3286
1590	Seq. ID No. 3287	Seq. ID No. 3288
1591	Seq. ID No. 3289	Seq. ID No. 3290
1592b	Seq. ID No. 3293	Seq. ID No. 3294
1593	Seq. ID No. 3295	Seq. ID No. 3296
1594b	Seq. ID No. 3299	Seq. ID No. 3300
1595a	Seq. ID No. 3301	Seq. ID No. 3302
1598a	Seq. ID No. 3305	Seq. ID No. 3306
1600a	Seq. ID No. 3309	Seq. ID No. 3310
1602	Seq. ID No. 3315	Seq. ID No. 3316
1606b	Seq. ID No. 3319	Seq. ID No. 3320
1607a	Seq. ID No. 3321	Seq. ID No. 3322
1610a	Seq. ID No. 3327	Seq. ID No. 3328
1616a	Seq. ID No. 3333	Seq. ID No. 3334
1619	Seq. ID No. 3337	Seq. ID No. 3338
1623a	Seq. ID No. 3343	Seq. ID No. 3344
1625b	Seq. ID No. 3353	Seq. ID No. 3354
1626b	Seq. ID No. 3359	Seq. ID No. 3360
1628a	Seq. ID No. 3361	Seq. ID No. 3362
1632a	Seq. ID No. 3365	Seq. ID No. 3366
1634a	Seq. ID No. 3373	Seq. ID No. 3374
1642a	Seq. ID No. 3381	Seq. ID No. 3382
1643a	Seq. ID No. 3385	Seq. ID No. 3386
1646c	Seq. ID No. 3393	Seq. ID No. 3394
1647	Seq. ID No. 3401	Seq. ID No. 3402

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1649b	Seq. ID No. 3407	Seq. ID No. 3408
1652a	Seq. ID No. 3411	Seq. ID No. 3412
1654	Seq. ID No. 3415	Seq. ID No. 3416
1656b	Seq. ID No. 3417	Seq. ID No. 3418
1659b	Seq. ID No. 3423	Seq. ID No. 3424
1662a	Seq. ID No. 3429	Seq. ID No. 3430
1665a	Seq. ID No. 3437	Seq. ID No. 3438
1668	Seq. ID No. 3439	Seq. ID No. 3440
1670a	Seq. ID No. 3443	Seq. ID No. 3444
1673f	Seq. ID No. 3459	Seq. ID No. 3460
1674	Seq. ID No. 3461	Seq. ID No. 3462
1675b	Seq. ID No. 3465	Seq. ID No. 3466
1676	Seq. ID No. 3469	Seq. ID No. 3470
1677	Seq. ID No. 3471	Seq. ID No. 3472
1679	Seq. ID No. 3473	Seq. ID No. 3474
1680	Seq. ID No. 3475	Seq. ID No. 3476
1682a	Seq. ID No. 3477	Seq. ID No. 3478
1683b	Seq. ID No. 3483	Seq. ID No. 3484
1685	Seq. ID No. 3487	Seq. ID No. 3488
1688c	Seq. ID No. 3495	Seq. ID No. 3496
1689a	Seq. ID No. 3497	Seq. ID No. 3498
1690b	Seq. ID No. 3505	Seq. ID No. 3506
1691	Seq. ID No. 3507	Seq. ID No. 3508
1692	Seq. ID No. 3509	Seq. ID No. 3510
1693	Seq. ID No. 3511	Seq. ID No. 3512
1694b	Seq. ID No. 3515	Seq. ID No. 3516
1696	Seq. ID No. 3521	Seq. ID No. 3522
1697a	Seq. ID No. 3523	Seq. ID No. 3524

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1699b	Seq. ID No. 3529	Seq. ID No. 3530
1701a	Seq. ID No. 3535	Seq. ID No. 3536
1704a	Seq. ID No. 3541	Seq. ID No. 3542
1707a	Seq. ID No. 3551	Seq. ID No. 3552
1710a	Seq. ID No. 3559	Seq. ID No. 3560
1712a	Seq. ID No. 3563	Seq. ID No. 3564
1715a	Seq. ID No. 3567	Seq. ID No. 3568
1722	Seq. ID No. 3575	Seq. ID No. 3576
1723a	Seq. ID No. 3577	Seq. ID No. 3578
1727	Seq. ID No. 3583	Seq. ID No. 3584
1728	Seq. ID No. 3585	Seq. ID No. 3586
1733	Seq. ID No. 3589	Seq. ID No. 3590
1734	Seq. ID No. 3591	Seq. ID No. 3592
1737b	Seq. ID No. 3599	Seq. ID No. 3600
1738a	Seq. ID No. 3601	Seq. ID No. 3602
1739	Seq. ID No. 3607	Seq. ID No. 3608
1741	Seq. ID No. 3609	Seq. ID No. 3610
1743	Seq. ID No. 3611	Seq. ID No. 3612
1744b	Seq. ID No. 3615	Seq. ID No. 3616
1747	Seq. ID No. 3619	Seq. ID No. 3620
1752b	Seq. ID No. 3629	Seq. ID No. 3630
1753	Seq. ID No. 3631	Seq. ID No. 3632
1756a	Seq. ID No. 3633	Seq. ID No. 3634
1757a	Seq. ID No. 3637	Seq. ID No. 3638
1759	Seq. ID No. 3641	Seq. ID No. 3642
1760	Seq. ID No. 3643	Seq. ID No. 3644
1762	Seq. ID No. 3645	Seq. ID No. 3646
1764c	Seq. ID No. 3651	Seq. ID No. 3652

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1765	Seq. ID No. 3653	Seq. ID No. 3654
1766	Seq. ID No. 3655	Seq. ID No. 3656
1769a	Seq. ID No. 3661	Seq. ID No. 3662
1771	Seq. ID No. 3665	Seq. ID No. 3666
1773	Seq. ID No. 3667	Seq. ID No. 3668
1774	Seq. ID No. 3669	Seq. ID No. 3670
1775c	Seq. ID No. 3675	Seq. ID No. 3676
1780	Seq. ID No. 3681	Seq. ID No. 3682
1784b	Seq. ID No. 3689	Seq. ID No. 3690
1788c	Seq. ID No. 3695	Seq. ID No. 3696
1789a	Seq. ID No. 3697	Seq. ID No. 3698
1792a	Seq. ID No. 3705	Seq. ID No. 3706
1793a	Seq. ID No. 3711	Seq. ID No. 3712
1797a	Seq. ID No. 3719	Seq. ID No. 3720
1798b	Seq. ID No. 3725	Seq. ID No. 3726
1800	Seq. ID No. 3729	Seq. ID No. 3730
1802a	Seq. ID No. 3731	Seq. ID No. 3732
1803	Seq. ID No. 3735	Seq. ID No. 3736
1804b	Seq. ID No. 3739	Seq. ID No. 3740
1805	Seq. ID No. 3741	Seq. ID No. 3742
1806a	Seq. ID No. 3743	Seq. ID No. 3744
1807a	Seq. ID No. 3749	Seq. ID No. 3750
1808d	Seq. ID No. 3759	Seq. ID No. 3760
1809e	Seq. ID No. 3769	Seq. ID No. 3770
1810a	Seq. ID No. 3773	Seq. ID No. 3774
1811a	Seq. ID No. 3777	Seq. ID No. 3778
1812a	Seq. ID No. 3781	Seq. ID No. 3782
1815a	Seq. ID No. 3787	Seq. ID No. 3788



**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1816b	Seq. ID No. 3795	Seq. ID No. 3796
1819a	Seq. ID No. 3801	Seq. ID No. 3802
1821	Seq. ID No. 3805	Seq. ID No. 3806
1823a	Seq. ID No. 3809	Seq. ID No. 3810
1825	Seq. ID No. 3813	Seq. ID No. 3814
1828	Seq. ID No. 3819	Seq. ID No. 3820
1830a	Seq. ID No. 3821	Seq. ID No. 3822
1833	Seq. ID No. 3825	Seq. ID No. 3826
1834	Seq. ID No. 3827	Seq. ID No. 3828
1835	Seq. ID No. 3829	Seq. ID No. 3830
1836a	Seq. ID No. 3831	Seq. ID No. 3832
1837	Seq. ID No. 3835	Seq. ID No. 3836
1838c	Seq. ID No. 3841	Seq. ID No. 3842
1839a	Seq. ID No. 3845	Seq. ID No. 3846
1842d	Seq. ID No. 3855	Seq. ID No. 3856
1843	Seq. ID No. 3857	Seq. ID No. 3858
1845c	Seq. ID No. 3863	Seq. ID No. 3864
1848b	Seq. ID No. 3867	Seq. ID No. 3868
1850a	Seq. ID No. 3869	Seq. ID No. 3870
1853a	Seq. ID No. 3875	Seq. ID No. 3876
1854b	Seq. ID No. 3881	Seq. ID No. 3882
1855	Seq. ID No. 3883	Seq. ID No. 3884
1856	Seq. ID No. 3885	Seq. ID No. 3886
1857a	Seq. ID No. 3887	Seq. ID No. 3888
1859	Seq. ID No. 3897	Seq. ID No. 3898
1861b	Seq. ID No. 3901	Seq. ID No. 3902
1863a	Seq. ID No. 3905	Seq. ID No. 3906
1864a	Seq. ID No. 3909	Seq. ID No. 3910

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1865b	Seq. ID No. 3913	Seq. ID No. 3914
1868	Seq. ID No. 3915	Seq. ID No. 3916
1869	Seq. ID No. 3917	Seq. ID No. 3918
1870	Seq. ID No. 3919	Seq. ID No. 3920
1873a	Seq. ID No. 3921	Seq. ID No. 3922
1875c	Seq. ID No. 3929	Seq. ID No. 3930
1877a	Seq. ID No. 3931	Seq. ID No. 3932
1878	Seq. ID No. 3935	Seq. ID No. 3936
1884	Seq. ID No. 3941	Seq. ID No. 3942
1886	Seq. ID No. 3943	Seq. ID No. 3944
1887	Seq. ID No. 3945	Seq. ID No. 3946
1888a	Seq. ID No. 3947	Seq. ID No. 3948
1890	Seq. ID No. 3951	Seq. ID No. 3952
1891a	Seq. ID No. 3953	Seq. ID No. 3954
1893	Seq. ID No. 3957	Seq. ID No. 3958
1897c	Seq. ID No. 3971	Seq. ID No. 3972
1899	Seq. ID No. 3977	Seq. ID No. 3978
1902a	Seq. ID No. 3981	Seq. ID No. 3982
1907	Seq. ID No. 3985	Seq. ID No. 3986
1912	Seq. ID No. 3987	Seq. ID No. 3988
1915a	Seq. ID No. 3989	Seq. ID No. 3990
1916	Seq. ID No. 3993	Seq. ID No. 3994
1918c	Seq. ID No. 4001	Seq. ID No. 4002
1919a	Seq. ID No. 4005	Seq. ID No. 4006
1923a	Seq. ID No. 4011	Seq. ID No. 4012
1925	Seq. ID No. 4015	Seq. ID No. 4016
1926	Seq. ID No. 4017	Seq. ID No. 4018
1927a	Seq. ID No. 4019	Seq. ID No. 4020

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1930	Seq. ID No. 4023	Seq. ID No. 4024
1931c	Seq. ID No. 4029	Seq. ID No. 4030
1932	Seq. ID No. 4031	Seq. ID No. 4032
1933a	Seq. ID No. 4033	Seq. ID No. 4034
1934	Seq. ID No. 4037	Seq. ID No. 4038
1936	Seq. ID No. 4039	Seq. ID No. 4040
1937e	Seq. ID No. 4049	Seq. ID No. 4050
1939a	Seq. ID No. 4051	Seq. ID No. 4052
1940	Seq. ID No. 4057	Seq. ID No. 4058
1941a	Seq. ID No. 4059	Seq. ID No. 4060
1943a	Seq. ID No. 4065	Seq. ID No. 4066
1944	Seq. ID No. 4069	Seq. ID No. 4070
1946c	Seq. ID No. 4075	Seq. ID No. 4076
1950	Seq. ID No. 4079	Seq. ID No. 4080
1951c	Seq. ID No. 4085	Seq. ID No. 4086
1953	Seq. ID No. 4089	Seq. ID No. 4090
1954c	Seq. ID No. 4095	Seq. ID No. 4096
1956	Seq. ID No. 4097	Seq. ID No. 4098
1957	Seq. ID No. 4099	Seq. ID No. 4100
1958c	Seq. ID No. 4105	Seq. ID No. 4106
1960c	Seq. ID No. 4111	Seq. ID No. 4112
1962a	Seq. ID No. 4115	Seq. ID No. 4116
1965b	Seq. ID No. 4121	Seq. ID No. 4122
1966	Seq. ID No. 4123	Seq. ID No. 4124
1968	Seq. ID No. 4127	Seq. ID No. 4128
1969	Seq. ID No. 4129	Seq. ID No. 4130
1970a	Seq. ID No. 4131	Seq. ID No. 4132
1973	Seq. ID No. 4137	Seq. ID No. 4138

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1977a	Seq. ID No. 4141	Seq. ID No. 4142
1979a	Seq. ID No. 4147	Seq. ID No. 4148
1982	Seq. ID No. 4157	Seq. ID No. 4158
1985a	Seq. ID No. 4159	Seq. ID No. 4160
1986	Seq. ID No. 4163	Seq. ID No. 4164
1987a	Seq. ID No. 4165	Seq. ID No. 4166
1989a	Seq. ID No. 4169	Seq. ID No. 4170
1990c	Seq. ID No. 4179	Seq. ID No. 4180
1992a	Seq. ID No. 4183	Seq. ID No. 4184
1993a	Seq. ID No. 4187	Seq. ID No. 4188
1996	Seq. ID No. 4193	Seq. ID No. 4194
2000	Seq. ID No. 4195	Seq. ID No. 4196
2001	Seq. ID No. 4197	Seq. ID No. 4198
2003	Seq. ID No. 4199	Seq. ID No. 4200
2006	Seq. ID No. 4201	Seq. ID No. 4202
2010	Seq. ID No. 4205	Seq. ID No. 4206
2011a	Seq. ID No. 4207	Seq. ID No. 4208
2013a	Seq. ID No. 4213	Seq. ID No. 4214
2015	Seq. ID No. 4219	Seq. ID No. 4220
2016h	Seq. ID No. 4235	Seq. ID No. 4236
2020	Seq. ID No. 4237	Seq. ID No. 4238
2021	Seq. ID No. 4239	Seq. ID No. 4240
2023b	Seq. ID No. 4243	Seq. ID No. 4244
2024a	Seq. ID No. 4245	Seq. ID No. 4246
2027	Seq. ID No. 4255	Seq. ID No. 4256
2030b	Seq. ID No. 4259	Seq. ID No. 4260
2033	Seq. ID No. 4267	Seq. ID No. 4268
2036	Seq. ID No. 4271	Seq. ID No. 4272

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2040a	Seq. ID No. 4277	Seq. ID No. 4278
2042	Seq. ID No. 4279	Seq. ID No. 4280
2043b	Seq. ID No. 4281	Seq. ID No. 4282
2044	Seq. ID No. 4283	Seq. ID No. 4284
2046a	Seq. ID No. 4289	Seq. ID No. 4290
2047a	Seq. ID No. 4293	Seq. ID No. 4294
2050	Seq. ID No. 4299	Seq. ID No. 4300
2053	Seq. ID No. 4301	Seq. ID No. 4302
2054	Seq. ID No. 4303	Seq. ID No. 4304
2055	Seq. ID No. 4305	Seq. ID No. 4306
2056	Seq. ID No. 4307	Seq. ID No. 4308
2057	Seq. ID No. 4309	Seq. ID No. 4310
2059b	Seq. ID No. 4313	Seq. ID No. 4314
2060a	Seq. ID No. 4315	Seq. ID No. 4316
2062c	Seq. ID No. 4323	Seq. ID No. 4324
2064	Seq. ID No. 4325	Seq. ID No. 4326
2065a	Seq. ID No. 4327	Seq. ID No. 4328
2066	Seq. ID No. 4331	Seq. ID No. 4332
2068	Seq. ID No. 4333	Seq. ID No. 4334
2069b	Seq. ID No. 4337	Seq. ID No. 4338
2074a	Seq. ID No. 4341	Seq. ID No. 4342
2075a	Seq. ID No. 4345	Seq. ID No. 4346
2076a	Seq. ID No. 4349	Seq. ID No. 4350
2078	Seq. ID No. 4355	Seq. ID No. 4356
2079a	Seq. ID No. 4357	Seq. ID No. 4358
2081b	Seq. ID No. 4365	Seq. ID No. 4366
2086a	Seq. ID No. 4367	Seq. ID No. 4368
2087a	Seq. ID No. 4371	Seq. ID No. 4372

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2088	Seq. ID No. 4375	Seq. ID No. 4376
2091	Seq. ID No. 4377	Seq. ID No. 4378
2092	Seq. ID No. 4379	Seq. ID No. 4380
2094	Seq. ID No. 4383	Seq. ID No. 4384
2096b	Seq. ID No. 4387	Seq. ID No. 4388
2097	Seq. ID No. 4393	Seq. ID No. 4394
2100	Seq. ID No. 4397	Seq. ID No. 4398
2104	Seq. ID No. 4401	Seq. ID No. 4402
2109a	Seq. ID No. 4409	Seq. ID No. 4410
2110a	Seq. ID No. 4413	Seq. ID No. 4414
2112b	Seq. ID No. 4421	Seq. ID No. 4422
2116	Seq. ID No. 4433	Seq. ID No. 4434
2117	Seq. ID No. 4435	Seq. ID No. 4436
2124a	Seq. ID No. 4445	Seq. ID No. 4446
2125a	Seq. ID No. 4449	Seq. ID No. 4450
2128a	Seq. ID No. 4457	Seq. ID No. 4458
2133	Seq. ID No. 4461	Seq. ID No. 4462
2138a	Seq. ID No. 4463	Seq. ID No. 4464
2140b	Seq. ID No. 4471	Seq. ID No. 4472
2142b	Seq. ID No. 4475	Seq. ID No. 4476
2144a	Seq. ID No. 4477	Seq. ID No. 4478
2146	Seq. ID No. 4481	Seq. ID No. 4482
2147c	Seq. ID No. 4487	Seq. ID No. 4488
2149b	Seq. ID No. 4491	Seq. ID No. 4492
2152a	Seq. ID No. 4499	Seq. ID No. 4500
2153	Seq. ID No. 4501	Seq. ID No. 4502
2155a	Seq. ID No. 4503	Seq. ID No. 4504
2156b	Seq. ID No. 4509	Seq. ID No. 4510

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2160a	Seq. ID No. 4517	Seq. ID No. 4518
2164	Seq. ID No. 4531	Seq. ID No. 4532
2165	Seq. ID No. 4533	Seq. ID No. 4534
2166a	Seq. ID No. 4535	Seq. ID No. 4536
2169	Seq. ID No. 4539	Seq. ID No. 4540
2171	Seq. ID No. 4541	Seq. ID No. 4542
2173a	Seq. ID No. 4545	Seq. ID No. 4546
2174	Seq. ID No. 4549	Seq. ID No. 4550
2176c	Seq. ID No. 4557	Seq. ID No. 4558
2179a	Seq. ID No. 4563	Seq. ID No. 4564
2180	Seq. ID No. 4567	Seq. ID No. 4568
2181a	Seq. ID No. 4569	Seq. ID No. 4570
2183	Seq. ID No. 4575	Seq. ID No. 4576
2185	Seq. ID No. 4577	Seq. ID No. 4578
2186a	Seq. ID No. 4579	Seq. ID No. 4580
2189a	Seq. ID No. 4583	Seq. ID No. 4584
2193	Seq. ID No. 4591	Seq. ID No. 4592
2194a	Seq. ID No. 4593	Seq. ID No. 4594
2196	Seq. ID No. 4597	Seq. ID No. 4598
2197b	Seq. ID No. 4601	Seq. ID No. 4602
2201a	Seq. ID No. 4605	Seq. ID No. 4606
2203	Seq. ID No. 4609	Seq. ID No. 4610
2204	Seq. ID No. 4611	Seq. ID No. 4612
2206a	Seq. ID No. 4613	Seq. ID No. 4614
2209	Seq. ID No. 4623	Seq. ID No. 4624
2212a	Seq. ID No. 4625	Seq. ID No. 4626
2215a	Seq. ID No. 4629	Seq. ID No. 4630
2216a	Seq. ID No. 4633	Seq. ID No. 4634

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2218	Seq. ID No. 4637	Seq. ID No. 4638
2219b	Seq. ID No. 4641	Seq. ID No. 4642
2220a	Seq. ID No. 4645	Seq. ID No. 4646
2221	Seq. ID No. 4651	Seq. ID No. 4652
2222	Seq. ID No. 4653	Seq. ID No. 4654
2223a	Seq. ID No. 4655	Seq. ID No. 4656
2226	Seq. ID No. 4661	Seq. ID No. 4662
2227	Seq. ID No. 4663	Seq. ID No. 4664
2228c	Seq. ID No. 4669	Seq. ID No. 4670
2231	Seq. ID No. 4671	Seq. ID No. 4672
2232	Seq. ID No. 4673	Seq. ID No. 4674
2234a	Seq. ID No. 4675	Seq. ID No. 4676
2238	Seq. ID No. 4685	Seq. ID No. 4686
2240a	Seq. ID No. 4689	Seq. ID No. 4690
2244	Seq. ID No. 4697	Seq. ID No. 4698
2248	Seq. ID No. 4703	Seq. ID No. 4704
2249	Seq. ID No. 4705	Seq. ID No. 4706
2253d	Seq. ID No. 4713	Seq. ID No. 4714
2255b	Seq. ID No. 4717	Seq. ID No. 4718
2256	Seq. ID No. 4719	Seq. ID No. 4720
2259a	Seq. ID No. 4723	Seq. ID No. 4724
2260c	Seq. ID No. 4729	Seq. ID No. 4730
2262	Seq. ID No. 4731	Seq. ID No. 4732
2263	Seq. ID No. 4733	Seq. ID No. 4734
2267	Seq. ID No. 4739	Seq. ID No. 4740
2269	Seq. ID No. 4743	Seq. ID No. 4744
2270	Seq. ID No. 4745	Seq. ID No. 4746
2272	Seq. ID No. 4747	Seq. ID No. 4748



**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2273	Seq. ID No. 4749	Seq. ID No. 4750
2274	Seq. ID No. 4751	Seq. ID No. 4752
2275a	Seq. ID No. 4753	Seq. ID No. 4754
2276b	Seq. ID No. 4761	Seq. ID No. 4762
2277a	Seq. ID No. 4767	Seq. ID No. 4768
2278a	Seq. ID No. 4771	Seq. ID No. 4772
2280	Seq. ID No. 4779	Seq. ID No. 4780
2284	Seq. ID No. 4781	Seq. ID No. 4782
2285	Seq. ID No. 4783	Seq. ID No. 4784
2286a	Seq. ID No. 4785	Seq. ID No. 4786
2288	Seq. ID No. 4789	Seq. ID No. 4790
2290	Seq. ID No. 4791	Seq. ID No. 4792
2291a	Seq. ID No. 4793	Seq. ID No. 4794
2292a	Seq. ID No. 4799	Seq. ID No. 4800
2297	Seq. ID No. 4807	Seq. ID No. 4808
2298	Seq. ID No. 4809	Seq. ID No. 4810
2299	Seq. ID No. 4811	Seq. ID No. 4812
2300	Seq. ID No. 4813	Seq. ID No. 4814
2301	Seq. ID No. 4815	Seq. ID No. 4816
2304	Seq. ID No. 4821	Seq. ID No. 4822
2307	Seq. ID No. 4825	Seq. ID No. 4826
2308	Seq. ID No. 4827	Seq. ID No. 4828
2309a	Seq. ID No. 4829	Seq. ID No. 4830
2311	Seq. ID No. 4837	Seq. ID No. 4838
2312a	Seq. ID No. 4839	Seq. ID No. 4840
2314	Seq. ID No. 4845	Seq. ID No. 4846
2315	Seq. ID No. 4847	Seq. ID No. 4848
2316	Seq. ID No. 4849	Seq. ID No. 4850

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2321b	Seq. ID No. 4857	Seq. ID No. 4858
2322	Seq. ID No. 4861	Seq. ID No. 4862
2327	Seq. ID No. 4865	Seq. ID No. 4866
2328	Seq. ID No. 4867	Seq. ID No. 4868
2329d	Seq. ID No. 4875	Seq. ID No. 4876
2331	Seq. ID No. 4879	Seq. ID No. 4880
2333	Seq. ID No. 4881	Seq. ID No. 4882
2335	Seq. ID No. 4883	Seq. ID No. 4884
2336	Seq. ID No. 4885	Seq. ID No. 4886
2337b	Seq. ID No. 4887	Seq. ID No. 4888
2338c	Seq. ID No. 4893	Seq. ID No. 4894
2342c	Seq. ID No. 4899	Seq. ID No. 4900
2344	Seq. ID No. 4901	Seq. ID No. 4902
2345	Seq. ID No. 4903	Seq. ID No. 4904
2347	Seq. ID No. 4905	Seq. ID No. 4906
2348	Seq. ID No. 4907	Seq. ID No. 4908
2349a	Seq. ID No. 4909	Seq. ID No. 4910
2353	Seq. ID No. 4915	Seq. ID No. 4916
2354	Seq. ID No. 4917	Seq. ID No. 4918
2357	Seq. ID No. 4919	Seq. ID No. 4920
2358	Seq. ID No. 4921	Seq. ID No. 4922
2361a	Seq. ID No. 4925	Seq. ID No. 4926
2363a	Seq. ID No. 4929	Seq. ID No. 4930
2365a	Seq. ID No. 4933	Seq. ID No. 4934
2366a	Seq. ID No. 4937	Seq. ID No. 4938
2367	Seq. ID No. 4941	Seq. ID No. 4942
2368	Seq. ID No. 4943	Seq. ID No. 4944
2369	Seq. ID No. 4945	Seq. ID No. 4946

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2370	Seq. ID No. 4947	Seq. ID No. 4948
2373	Seq. ID No. 4953	Seq. ID No. 4954
2374a	Seq. ID No. 4955	Seq. ID No. 4956
2376	Seq. ID No. 4959	Seq. ID No. 4960
2377a	Seq. ID No. 4961	Seq. ID No. 4962
2378	Seq. ID No. 4965	Seq. ID No. 4966
2379a	Seq. ID No. 4967	Seq. ID No. 4968
2380	Seq. ID No. 4971	Seq. ID No. 4972
2381	Seq. ID No. 4973	Seq. ID No. 4974
2384a	Seq. ID No. 4977	Seq. ID No. 4978
2387	Seq. ID No. 4985	Seq. ID No. 4986
2391	Seq. ID No. 4989	Seq. ID No. 4990
2392	Seq. ID No. 4991	Seq. ID No. 4992
2395	Seq. ID No. 4995	Seq. ID No. 4996
2396	Seq. ID No. 4997	Seq. ID No. 4998
2399b	Seq. ID No. 5005	Seq. ID No. 5006
2401	Seq. ID No. 5009	Seq. ID No. 5010
2403a	Seq. ID No. 5015	Seq. ID No. 5016
2404a	Seq. ID No. 5019	Seq. ID No. 5020
2409a	Seq. ID No. 5025	Seq. ID No. 5026
2410	Seq. ID No. 5029	Seq. ID No. 5030
2415a	Seq. ID No. 5037	Seq. ID No. 5038
2417a	Seq. ID No. 5045	Seq. ID No. 5046
2418a	Seq. ID No. 5049	Seq. ID No. 5050
2420	Seq. ID No. 5053	Seq. ID No. 5054
2421	Seq. ID No. 5055	Seq. ID No. 5056
2422c	Seq. ID No. 5059	Seq. ID No. 5060
2423a	Seq. ID No. 5061	Seq. ID No. 5062

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2424a	Seq. ID No. 5065	Seq. ID No. 5066
2426	Seq. ID No. 5071	Seq. ID No. 5072
2428a	Seq. ID No. 5073	Seq. ID No. 5074
2429	Seq. ID No. 5079	Seq. ID No. 5080
2432	Seq. ID No. 5081	Seq. ID No. 5082
2433	Seq. ID No. 5083	Seq. ID No. 5084
2440	Seq. ID No. 5087	Seq. ID No. 5088
2442a	Seq. ID No. 5089	Seq. ID No. 5090
2443	Seq. ID No. 5093	Seq. ID No. 5094
2444a	Seq. ID No. 5095	Seq. ID No. 5096
2445	Seq. ID No. 5103	Seq. ID No. 5104
2448b	Seq. ID No. 5105	Seq. ID No. 5106
2449a	Seq. ID No. 5107	Seq. ID No. 5108
2451	Seq. ID No. 5111	Seq. ID No. 5112
2452	Seq. ID No. 5113	Seq. ID No. 5114
2453	Seq. ID No. 5115	Seq. ID No. 5116
2455	Seq. ID No. 5117	Seq. ID No. 5118
2456a	Seq. ID No. 5119	Seq. ID No. 5120
2458g	Seq. ID No. 5141	Seq. ID No. 5142
2461a	Seq. ID No. 5143	Seq. ID No. 5144
2462a	Seq. ID No. 5147	Seq. ID No. 5148
2464	Seq. ID No. 5153	Seq. ID No. 5154
2465a	Seq. ID No. 5155	Seq. ID No. 5156
2469a	Seq. ID No. 5163	Seq. ID No. 5164
2471	Seq. ID No. 5169	Seq. ID No. 5170
2473	Seq. ID No. 5171	Seq. ID No. 5172
2474a	Seq. ID No. 5173	Seq. ID No. 5174
2475a	Seq. ID No. 5179	Seq. ID No. 5180

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2477	Seq. ID No. 5185	Seq. ID No. 5186
2480	Seq. ID No. 5187	Seq. ID No. 5188
2482	Seq. ID No. 5193	Seq. ID No. 5194
2483	Seq. ID No. 5195	Seq. ID No. 5196
2485	Seq. ID No. 5201	Seq. ID No. 5202
2489	Seq. ID No. 5203	Seq. ID No. 5204
2490	Seq. ID No. 5205	Seq. ID No. 5206
2492b	Seq. ID No. 5209	Seq. ID No. 5210
2494	Seq. ID No. 5211	Seq. ID No. 5212
2495a	Seq. ID No. 5213	Seq. ID No. 5214
2497a	Seq. ID No. 5217	Seq. ID No. 5218
2500b	Seq. ID No. 5225	Seq. ID No. 5226
2501b	Seq. ID No. 5231	Seq. ID No. 5232
2504a	Seq. ID No. 5233	Seq. ID No. 5234
2505	Seq. ID No. 5237	Seq. ID No. 5238
2506	Seq. ID No. 5239	Seq. ID No. 5240
2510	Seq. ID No. 5245	Seq. ID No. 5246
2512c	Seq. ID No. 5247	Seq. ID No. 5248
2513a	Seq. ID No. 5249	Seq. ID No. 5250
2514	Seq. ID No. 5255	Seq. ID No. 5256
2515	Seq. ID No. 5257	Seq. ID No. 5258
2516a	Seq. ID No. 5259	Seq. ID No. 5260
2517a	Seq. ID No. 5263	Seq. ID No. 5264
2519a	Seq. ID No. 5269	Seq. ID No. 5270
2520a	Seq. ID No. 5273	Seq. ID No. 5274
2523	Seq. ID No. 5283	Seq. ID No. 5284
2527a	Seq. ID No. 5289	Seq. ID No. 5290
2528a	Seq. ID No. 5293	Seq. ID No. 5294

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2535a	Seq. ID No. 5307	Seq. ID No. 5308
2538	Seq. ID No. 5311	Seq. ID No. 5312
2541	Seq. ID No. 5313	Seq. ID No. 5314
2542a	Seq. ID No. 5315	Seq. ID No. 5316
2544	Seq. ID No. 5323	Seq. ID No. 5324
2545	Seq. ID No. 5325	Seq. ID No. 5326
2548b	Seq. ID No. 5335	Seq. ID No. 5336
2549	Seq. ID No. 5337	Seq. ID No. 5338
2550b	Seq. ID No. 5339	Seq. ID No. 5340
2552	Seq. ID No. 5345	Seq. ID No. 5346
2553	Seq. ID No. 5347	Seq. ID No. 5348
2554a	Seq. ID No. 5349	Seq. ID No. 5350
2555a	Seq. ID No. 5353	Seq. ID No. 5354
2558a	Seq. ID No. 5361	Seq. ID No. 5362
2559	Seq. ID No. 5365	Seq. ID No. 5366
2561	Seq. ID No. 5367	Seq. ID No. 5368
2562a	Seq. ID No. 5369	Seq. ID No. 5370
2563	Seq. ID No. 5373	Seq. ID No. 5374
2564a	Seq. ID No. 5375	Seq. ID No. 5376
2567b	Seq. ID No. 5387	Seq. ID No. 5388
2568	Seq. ID No. 5389	Seq. ID No. 5390
2572	Seq. ID No. 5391	Seq. ID No. 5392
2573	Seq. ID No. 5393	Seq. ID No. 5394
2575	Seq. ID No. 5395	Seq. ID No. 5396
2576	Seq. ID No. 5397	Seq. ID No. 5398
2578	Seq. ID No. 5399	Seq. ID No. 5400
2579b	Seq. ID No. 5401	Seq. ID No. 5402
2581	Seq. ID No. 5403	Seq. ID No. 5404

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2582a	Seq. ID No. 5405	Seq. ID No. 5406
2585	Seq. ID No. 5411	Seq. ID No. 5412
2587b	Seq. ID No. 5415	Seq. ID No. 5416
2588	Seq. ID No. 5417	Seq. ID No. 5418
2589	Seq. ID No. 5419	Seq. ID No. 5420
2591	Seq. ID No. 5421	Seq. ID No. 5422
2592	Seq. ID No. 5423	Seq. ID No. 5424
2594a	Seq. ID No. 5429	Seq. ID No. 5430
2596	Seq. ID No. 5433	Seq. ID No. 5434
2598	Seq. ID No. 5441	Seq. ID No. 5442
2602	Seq. ID No. 5443	Seq. ID No. 5444
2605a	Seq. ID No. 5445	Seq. ID No. 5446
2606	Seq. ID No. 5449	Seq. ID No. 5450
2608	Seq. ID No. 5451	Seq. ID No. 5452
2610	Seq. ID No. 5453	Seq. ID No. 5454
2611	Seq. ID No. 5455	Seq. ID No. 5456
2613	Seq. ID No. 5457	Seq. ID No. 5458
2616f	Seq. ID No. 5469	Seq. ID No. 5470
2617a	Seq. ID No. 5475	Seq. ID No. 5476
2619	Seq. ID No. 5483	Seq. ID No. 5484
2620	Seq. ID No. 5485	Seq. ID No. 5486
2623a	Seq. ID No. 5489	Seq. ID No. 5490
2624a	Seq. ID No. 5493	Seq. ID No. 5494
2625b	Seq. ID No. 5499	Seq. ID No. 5500
2626a	Seq. ID No. 5501	Seq. ID No. 5502
2627a	Seq. ID No. 5505	Seq. ID No. 5506
2628	Seq. ID No. 5509	Seq. ID No. 5510
2629a	Seq. ID No. 5511	Seq. ID No. 5512

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2633c	Seq. ID No. 5523	Seq. ID No. 5524
2637a	Seq. ID No. 5529	Seq. ID No. 5530
2643a	Seq. ID No. 5535	Seq. ID No. 5536
2645	Seq. ID No. 5539	Seq. ID No. 5540
2647	Seq. ID No. 5541	Seq. ID No. 5542
2649	Seq. ID No. 5547	Seq. ID No. 5548
2652a	Seq. ID No. 5551	Seq. ID No. 5552
2655a	Seq. ID No. 5555	Seq. ID No. 5556
2656	Seq. ID No. 5559	Seq. ID No. 5560
2658a	Seq. ID No. 5561	Seq. ID No. 5562
2659a	Seq. ID No. 5565	Seq. ID No. 5566
2662	Seq. ID No. 5571	Seq. ID No. 5572
2664a	Seq. ID No. 5573	Seq. ID No. 5574
2666a	Seq. ID No. 5579	Seq. ID No. 5580
2667a	Seq. ID No. 5583	Seq. ID No. 5584
2669b	Seq. ID No. 5589	Seq. ID No. 5590
2674b	Seq. ID No. 5599	Seq. ID No. 5600
2676	Seq. ID No. 5601	Seq. ID No. 5602
2677a	Seq. ID No. 5603	Seq. ID No. 5604
2679c	Seq. ID No. 5613	Seq. ID No. 5614
2680c	Seq. ID No. 5621	Seq. ID No. 5622
2684a	Seq. ID No. 5627	Seq. ID No. 5628
2686	Seq. ID No. 5631	Seq. ID No. 5632
2688b	Seq. ID No. 5635	Seq. ID No. 5636
2690b	Seq. ID No. 5645	Seq. ID No. 5646
2693	Seq. ID No. 5651	Seq. ID No. 5652
2694a	Seq. ID No. 5653	Seq. ID No. 5654
2695	Seq. ID No. 5657	Seq. ID No. 5658



**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2696b	Seq. ID No. 5661	Seq. ID No. 5662
2705	Seq. ID No. 5663	Seq. ID No. 5664
2709	Seq. ID No. 5665	Seq. ID No. 5666
2712	Seq. ID No. 5669	Seq. ID No. 5670
2713	Seq. ID No. 5671	Seq. ID No. 5672
2714	Seq. ID No. 5673	Seq. ID No. 5674
2716a	Seq. ID No. 5675	Seq. ID No. 5676
2718a	Seq. ID No. 5681	Seq. ID No. 5682
2721b	Seq. ID No. 5693	Seq. ID No. 5694
2722a	Seq. ID No. 5695	Seq. ID No. 5696
2723	Seq. ID No. 5699	Seq. ID No. 5700
2724	Seq. ID No. 5701	Seq. ID No. 5702
2726	Seq. ID No. 5707	Seq. ID No. 5708
2731a	Seq. ID No. 5713	Seq. ID No. 5714
2732	Seq. ID No. 5717	Seq. ID No. 5718
2734c	Seq. ID No. 5723	Seq. ID No. 5724
2735a	Seq. ID No. 5725	Seq. ID No. 5726
2738b	Seq. ID No. 5731	Seq. ID No. 5732
2742a	Seq. ID No. 5737	Seq. ID No. 5738
2745a	Seq. ID No. 5747	Seq. ID No. 5748
2746	Seq. ID No. 5751	Seq. ID No. 5752
2747b	Seq. ID No. 5755	Seq. ID No. 5756
2748b	Seq. ID No. 5759	Seq. ID No. 5760
2749e	Seq. ID No. 5771	Seq. ID No. 5772
2750a	Seq. ID No. 5773	Seq. ID No. 5774
2752	Seq. ID No. 5777	Seq. ID No. 5778
2753	Seq. ID No. 5779	Seq. ID No. 5780
2757a	Seq. ID No. 5781	Seq. ID No. 5782

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2758a	Seq. ID No. 5785	Seq. ID No. 5786
2759a	Seq. ID No. 5793	Seq. ID No. 5794
2760b	Seq. ID No. 5799	Seq. ID No. 5800
2763a	Seq. ID No. 5805	Seq. ID No. 5806
2764	Seq. ID No. 5811	Seq. ID No. 5812
2765c	Seq. ID No. 5815	Seq. ID No. 5816
2766a	Seq. ID No. 5817	Seq. ID No. 5818
2768b	Seq. ID No. 5823	Seq. ID No. 5824
2771a	Seq. ID No. 5831	Seq. ID No. 5832
2773	Seq. ID No. 5835	Seq. ID No. 5836
2774b	Seq. ID No. 5839	Seq. ID No. 5840
2776a	Seq. ID No. 5843	Seq. ID No. 5844
2777	Seq. ID No. 5847	Seq. ID No. 5848
2778	Seq. ID No. 5849	Seq. ID No. 5850
2779	Seq. ID No. 5851	Seq. ID No. 5852
2780	Seq. ID No. 5853	Seq. ID No. 5854
2784	Seq. ID No. 5855	Seq. ID No. 5856
2785a	Seq. ID No. 5857	Seq. ID No. 5858
2786a	Seq. ID No. 5861	Seq. ID No. 5862
2787a	Seq. ID No. 5867	Seq. ID No. 5868
2789	Seq. ID No. 5875	Seq. ID No. 5876
2790	Seq. ID No. 5877	Seq. ID No. 5878
2793	Seq. ID No. 5881	Seq. ID No. 5882
2799a	Seq. ID No. 5889	Seq. ID No. 5890
2801b	Seq. ID No. 5895	Seq. ID No. 5896
2804	Seq. ID No. 5897	Seq. ID No. 5898
2805b	Seq. ID No. 5901	Seq. ID No. 5902
2809	Seq. ID No. 5903	Seq. ID No. 5904

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2810b	Seq. ID No. 5907	Seq. ID No. 5908
2812	Seq. ID No. 5913	Seq. ID No. 5914
2814	Seq. ID No. 5915	Seq. ID No. 5916
2815	Seq. ID No. 5917	Seq. ID No. 5918
2816	Seq. ID No. 5919	Seq. ID No. 5920
2818c	Seq. ID No. 5925	Seq. ID No. 5926
2819	Seq. ID No. 5931	Seq. ID No. 5932
2820	Seq. ID No. 5933	Seq. ID No. 5934
2821a	Seq. ID No. 5935	Seq. ID No. 5936
2822b	Seq. ID No. 5941	Seq. ID No. 5942
2823	Seq. ID No. 5943	Seq. ID No. 5944
2824a	Seq. ID No. 5945	Seq. ID No. 5946
2829a	Seq. ID No. 5949	Seq. ID No. 5950
2832	Seq. ID No. 5955	Seq. ID No. 5956
2833	Seq. ID No. 5957	Seq. ID No. 5958
2834a	Seq. ID No. 5959	Seq. ID No. 5960
2842a	Seq. ID No. 5967	Seq. ID No. 5968
2843a	Seq. ID No. 5971	Seq. ID No. 5972
2845	Seq. ID No. 5975	Seq. ID No. 5976
2846a	Seq. ID No. 5977	Seq. ID No. 5978
2848	Seq. ID No. 5981	Seq. ID No. 5982
2850	Seq. ID No. 5983	Seq. ID No. 5984
2851	Seq. ID No. 5985	Seq. ID No. 5986
2853	Seq. ID No. 5989	Seq. ID No. 5990
2854a	Seq. ID No. 5991	Seq. ID No. 5992
2855	Seq. ID No. 5995	Seq. ID No. 5996
2856a	Seq. ID No. 5997	Seq. ID No. 5998
2857	Seq. ID No. 6003	Seq. ID No. 6004

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2859	Seq. ID No. 6005	Seq. ID No. 6006
2860a	Seq. ID No. 6007	Seq. ID No. 6008
2863	Seq. ID No. 6015	Seq. ID No. 6016
2864	Seq. ID No. 6017	Seq. ID No. 6018
2868a	Seq. ID No. 6019	Seq. ID No. 6020
2869a	Seq. ID No. 6023	Seq. ID No. 6024
2871	Seq. ID No. 6029	Seq. ID No. 6030
2875	Seq. ID No. 6033	Seq. ID No. 6034
2877	Seq. ID No. 6035	Seq. ID No. 6036
2879a	Seq. ID No. 6037	Seq. ID No. 6038
2881	Seq. ID No. 6043	Seq. ID No. 6044
2883b	Seq. ID No. 6049	Seq. ID No. 6050
2886a	Seq. ID No. 6055	Seq. ID No. 6056
2890	Seq. ID No. 6065	Seq. ID No. 6066
2891b	Seq. ID No. 6069	Seq. ID No. 6070
2894a	Seq. ID No. 6075	Seq. ID No. 6076
2895	Seq. ID No. 6081	Seq. ID No. 6082
2897a	Seq. ID No. 6083	Seq. ID No. 6084
2900a	Seq. ID No. 6087	Seq. ID No. 6088
2902	Seq. ID No. 6095	Seq. ID No. 6096
2904	Seq. ID No. 6097	Seq. ID No. 6098
2905a	Seq. ID No. 6099	Seq. ID No. 6100
2906	Seq. ID No. 6103	Seq. ID No. 6104
2909a	Seq. ID No. 6105	Seq. ID No. 6106
2912	Seq. ID No. 6113	Seq. ID No. 6114
2913a	Seq. ID No. 6115	Seq. ID No. 6116
2915a	Seq. ID No. 6119	Seq. ID No. 6120
2916	Seq. ID No. 6125	Seq. ID No. 6126

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2917	Seq. ID No. 6127	Seq. ID No. 6128
2918	Seq. ID No. 6129	Seq. ID No. 6130
2920	Seq. ID No. 6131	Seq. ID No. 6132
2921	Seq. ID No. 6133	Seq. ID No. 6134
2923c	Seq. ID No. 6141	Seq. ID No. 6142
2925a	Seq. ID No. 6143	Seq. ID No. 6144
2926a	Seq. ID No. 6147	Seq. ID No. 6148
2928a	Seq. ID No. 6153	Seq. ID No. 6154
2931c	Seq. ID No. 6165	Seq. ID No. 6166
2933b	Seq. ID No. 6169	Seq. ID No. 6170
2934	Seq. ID No. 6171	Seq. ID No. 6172
2935a	Seq. ID No. 6173	Seq. ID No. 6174
2936	Seq. ID No. 6177	Seq. ID No. 6178
2939a	Seq. ID No. 6179	Seq. ID No. 6180
2941c	Seq. ID No. 6187	Seq. ID No. 6188
2943c	Seq. ID No. 6193	Seq. ID No. 6194
2947	Seq. ID No. 6201	Seq. ID No. 6202
2948c	Seq. ID No. 6207	Seq. ID No. 6208
2950a	Seq. ID No. 6211	Seq. ID No. 6212
2951	Seq. ID No. 6215	Seq. ID No. 6216
2954	Seq. ID No. 6219	Seq. ID No. 6220
2955f	Seq. ID No. 6231	Seq. ID No. 6232
2957	Seq. ID No. 6235	Seq. ID No. 6236
2959	Seq. ID No. 6243	Seq. ID No. 6244
2962a	Seq. ID No. 6247	Seq. ID No. 6248
2963	Seq. ID No. 6251	Seq. ID No. 6252
2965b	Seq. ID No. 6255	Seq. ID No. 6256
2967	Seq. ID No. 6261	Seq. ID No. 6262

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2969	Seq. ID No. 6263	Seq. ID No. 6264
2971a	Seq. ID No. 6269	Seq. ID No. 6270
2974b	Seq. ID No. 6275	Seq. ID No. 6276
2975	Seq. ID No. 6277	Seq. ID No. 6278
2977a	Seq. ID No. 6279	Seq. ID No. 6280
2979	Seq. ID No. 6287	Seq. ID No. 6288
2980b	Seq. ID No. 6291	Seq. ID No. 6292
2984	Seq. ID No. 6299	Seq. ID No. 6300
2986c	Seq. ID No. 6305	Seq. ID No. 6306
2988a	Seq. ID No. 6307	Seq. ID No. 6308
2989	Seq. ID No. 6313	Seq. ID No. 6314
2990	Seq. ID No. 6315	Seq. ID No. 6316
2991c	Seq. ID No. 6321	Seq. ID No. 6322
2992	Seq. ID No. 6323	Seq. ID No. 6324
2993a	Seq. ID No. 6325	Seq. ID No. 6326
2995b	Seq. ID No. 6331	Seq. ID No. 6332
2998a	Seq. ID No. 6335	Seq. ID No. 6336
2999	Seq. ID No. 6339	Seq. ID No. 6340
3001	Seq. ID No. 6341	Seq. ID No. 6342
3003	Seq. ID No. 6343	Seq. ID No. 6344
3005	Seq. ID No. 6345	Seq. ID No. 6346
3008a	Seq. ID No. 6347	Seq. ID No. 6348
3010a	Seq. ID No. 6355	Seq. ID No. 6356
3012	Seq. ID No. 6359	Seq. ID No. 6360
3015	Seq. ID No. 6361	Seq. ID No. 6362
3016b	Seq. ID No. 6365	Seq. ID No. 6366
3017	Seq. ID No. 6369	Seq. ID No. 6370
3018a	Seq. ID No. 6371	Seq. ID No. 6372

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
3020	Seq. ID No. 6375	Seq. ID No. 6376
3021	Seq. ID No. 6377	Seq. ID No. 6378
3022	Seq. ID No. 6379	Seq. ID No. 6380
3026a	Seq. ID No. 6387	Seq. ID No. 6388
3028a	Seq. ID No. 6391	Seq. ID No. 6392
3029a	Seq. ID No. 6397	Seq. ID No. 6398
3031a	Seq. ID No. 6401	Seq. ID No. 6402
3032a	Seq. ID No. 6405	Seq. ID No. 6406
3033a	Seq. ID No. 6409	Seq. ID No. 6410
3035	Seq. ID No. 6413	Seq. ID No. 6414
3037b	Seq. ID No. 6417	Seq. ID No. 6418
3038	Seq. ID No. 6419	Seq. ID No. 6420
3040b	Seq. ID No. 6423	Seq. ID No. 6424
3043a	Seq. ID No. 6429	Seq. ID No. 6430
3044	Seq. ID No. 6433	Seq. ID No. 6434
3045a	Seq. ID No. 6435	Seq. ID No. 6436
3048a	Seq. ID No. 6439	Seq. ID No. 6440
3049c	Seq. ID No. 6445	Seq. ID No. 6446
3051a	Seq. ID No. 6447	Seq. ID No. 6448
3052	Seq. ID No. 6451	Seq. ID No. 6452
3055a	Seq. ID No. 6455	Seq. ID No. 6456
3057	Seq. ID No. 6459	Seq. ID No. 6460
3059	Seq. ID No. 6461	Seq. ID No. 6462
3060	Seq. ID No. 6463	Seq. ID No. 6464
3065a	Seq. ID No. 6475	Seq. ID No. 6476
3067	Seq. ID No. 6481	Seq. ID No. 6482
3068	Seq. ID No. 6483	Seq. ID No. 6484
3069	Seq. ID No. 6485	Seq. ID No. 6486

**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
3071	Seq. ID No. 6487	Seq. ID No. 6488
3072a	Seq. ID No. 6489	Seq. ID No. 6490
3073	Seq. ID No. 6491	Seq. ID No. 6492
3074	Seq. ID No. 6493	Seq. ID No. 6494
3075	Seq. ID No. 6495	Seq. ID No. 6496
3077a	Seq. ID No. 6499	Seq. ID No. 6500
3078	Seq. ID No. 6505	Seq. ID No. 6506
3081a	Seq. ID No. 6509	Seq. ID No. 6510
3083c	Seq. ID No. 6513	Seq. ID No. 6514
3086	Seq. ID No. 6519	Seq. ID No. 6520
3087a	Seq. ID No. 6521	Seq. ID No. 6522
3088	Seq. ID No. 6525	Seq. ID No. 6526
3089a	Seq. ID No. 6527	Seq. ID No. 6528
3090	Seq. ID No. 6531	Seq. ID No. 6532
3091	Seq. ID No. 6533	Seq. ID No. 6534
3092a	Seq. ID No. 6535	Seq. ID No. 6536
3097	Seq. ID No. 6545	Seq. ID No. 6546
3098c	Seq. ID No. 6551	Seq. ID No. 6552
3099	Seq. ID No. 6553	Seq. ID No. 6554
3101	Seq. ID No. 6559	Seq. ID No. 6560
3102	Seq. ID No. 6561	Seq. ID No. 6562
3103b	Seq. ID No. 6563	Seq. ID No. 6564
3104	Seq. ID No. 6565	Seq. ID No. 6566
3105	Seq. ID No. 6567	Seq. ID No. 6568
3106	Seq. ID No. 6569	Seq. ID No. 6570
3108a	Seq. ID No. 6575	Seq. ID No. 6576
3109	Seq. ID No. 6579	Seq. ID No. 6580
3110b	Seq. ID No. 6583	Seq. ID No. 6584



**TABLE 19: GENEMARK™ ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
3113	Seq. ID No. 6585	Seq. ID No. 6586
3118b	Seq. ID No. 6591	Seq. ID No. 6592
3119b	Seq. ID No. 6595	Seq. ID No. 6596
3121	Seq. ID No. 6605	Seq. ID No. 6606
3122a	Seq. ID No. 6607	Seq. ID No. 6608
3123a	Seq. ID No. 6611	Seq. ID No. 6612
3124	Seq. ID No. 6615	Seq. ID No. 6616
3126	Seq. ID No. 6617	Seq. ID No. 6618
3129a	Seq. ID No. 6619	Seq. ID No. 6620
3131	Seq. ID No. 6623	Seq. ID No. 6624
3134a	Seq. ID No. 6625	Seq. ID No. 6626
3138	Seq. ID No. 6629	Seq. ID No. 6630
3141	Seq. ID No. 6633	Seq. ID No. 6634
3145a	Seq. ID No. 6635	Seq. ID No. 6636
3147a	Seq. ID No. 6641	Seq. ID No. 6642
3149a	Seq. ID No. 6647	Seq. ID No. 6648

Listed in Table 20 are 2343 ORFs detected by the ORF finder program of Applicant's assignee that searches for one of the three potential Start codons between a Stop-Stop region. It first looks for a 'ATG' Start codon but will accept either a 'GTG' or 'TTG' Start codon if found first.

**TABLE 20: WYETH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1	Seq. ID No. 1	Seq. ID No. 2
2b	Seq. ID No. 5	Seq. ID No. 6
4c	Seq. ID No. 11	Seq. ID No. 12
5	Seq. ID No. 13	Seq. ID No. 14

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
7	Seq. ID No. 15	Seq. ID No. 16
10	Seq. ID No. 17	Seq. ID No. 18
11	Seq. ID No. 19	Seq. ID No. 20
13a	Seq. ID No. 21	Seq. ID No. 22
16	Seq. ID No. 23	Seq. ID No. 24
18	Seq. ID No. 27	Seq. ID No. 28
20	Seq. ID No. 29	Seq. ID No. 30
21b	Seq. ID No. 31	Seq. ID No. 32
23b	Seq. ID No. 35	Seq. ID No. 36
24	Seq. ID No. 37	Seq. ID No. 38
36	Seq. ID No. 41	Seq. ID No. 42
37	Seq. ID No. 43	Seq. ID No. 44
38a	Seq. ID No. 45	Seq. ID No. 46
38b	Seq. ID No. 47	Seq. ID No. 48
39a	Seq. ID No. 49	Seq. ID No. 50
39b	Seq. ID No. 51	Seq. ID No. 52
40	Seq. ID No. 53	Seq. ID No. 54
41a	Seq. ID No. 55	Seq. ID No. 56
41b	Seq. ID No. 57	Seq. ID No. 58
41c	Seq. ID No. 59	Seq. ID No. 60
44a	Seq. ID No. 65	Seq. ID No. 66
44b	Seq. ID No. 67	Seq. ID No. 68
47	Seq. ID No. 75	Seq. ID No. 76
48a	Seq. ID No. 77	Seq. ID No. 78
48b	Seq. ID No. 79	Seq. ID No. 80
48c	Seq. ID No. 81	Seq. ID No. 82
50	Seq. ID No. 83	Seq. ID No. 84
51c	Seq. ID No. 89	Seq. ID No. 90
55	Seq. ID No. 91	Seq. ID No. 92

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
56b	Seq. ID No. 93	Seq. ID No. 94
57b	Seq. ID No. 97	Seq. ID No. 98
58	Seq. ID No. 99	Seq. ID No. 100
60b	Seq. ID No. 103	Seq. ID No. 104
61	Seq. ID No. 105	Seq. ID No. 106
62a	Seq. ID No. 107	Seq. ID No. 108
62b	Seq. ID No. 109	Seq. ID No. 110
62c	Seq. ID No. 111	Seq. ID No. 112
63a	Seq. ID No. 113	Seq. ID No. 114
63b	Seq. ID No. 115	Seq. ID No. 116
65a	Seq. ID No. 117	Seq. ID No. 118
65b	Seq. ID No. 119	Seq. ID No. 120
65c	Seq. ID No. 121	Seq. ID No. 122
69	Seq. ID No. 127	Seq. ID No. 128
71	Seq. ID No. 129	Seq. ID No. 130
73a	Seq. ID No. 131	Seq. ID No. 132
73b	Seq. ID No. 133	Seq. ID No. 134
74	Seq. ID No. 135	Seq. ID No. 136
77	Seq. ID No. 137	Seq. ID No. 138
79	Seq. ID No. 139	Seq. ID No. 140
80b	Seq. ID No. 143	Seq. ID No. 144
80c	Seq. ID No. 145	Seq. ID No. 146
81a	Seq. ID No. 147	Seq. ID No. 148
81b	Seq. ID No. 149	Seq. ID No. 150
85a	Seq. ID No. 153	Seq. ID No. 154
85b	Seq. ID No. 155	Seq. ID No. 156
85c	Seq. ID No. 157	Seq. ID No. 158
86	Seq. ID No. 159	Seq. ID No. 160
87a	Seq. ID No. 161	Seq. ID No. 162

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
87b	Seq. ID No. 163	Seq. ID No. 164
87c	Seq. ID No. 165	Seq. ID No. 166
88	Seq. ID No. 167	Seq. ID No. 168
89	Seq. ID No. 169	Seq. ID No. 170
91a	Seq. ID No. 171	Seq. ID No. 172
91c	Seq. ID No. 175	Seq. ID No. 176
91d	Seq. ID No. 177	Seq. ID No. 178
93a	Seq. ID No. 179	Seq. ID No. 180
93b	Seq. ID No. 181	Seq. ID No. 182
93c	Seq. ID No. 183	Seq. ID No. 184
95b	Seq. ID No. 187	Seq. ID No. 188
99	Seq. ID No. 191	Seq. ID No. 192
101	Seq. ID No. 193	Seq. ID No. 194
102	Seq. ID No. 195	Seq. ID No. 196
104c	Seq. ID No. 201	Seq. ID No. 202
105b	Seq. ID No. 205	Seq. ID No. 206
106	Seq. ID No. 207	Seq. ID No. 208
109d	Seq. ID No. 215	Seq. ID No. 216
111b	Seq. ID No. 219	Seq. ID No. 220
112a	Seq. ID No. 221	Seq. ID No. 222
112b	Seq. ID No. 223	Seq. ID No. 224
114	Seq. ID No. 225	Seq. ID No. 226
115	Seq. ID No. 227	Seq. ID No. 228
119b	Seq. ID No. 231	Seq. ID No. 232
121	Seq. ID No. 233	Seq. ID No. 234
124c	Seq. ID No. 239	Seq. ID No. 240
127a	Seq. ID No. 243	Seq. ID No. 244
127b	Seq. ID No. 245	Seq. ID No. 246
127c	Seq. ID No. 247	Seq. ID No. 248

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
129c	Seq. ID No. 253	Seq. ID No. 254
132b	Seq. ID No. 257	Seq. ID No. 258
132c	Seq. ID No. 259	Seq. ID No. 260
134	Seq. ID No. 261	Seq. ID No. 262
135a	Seq. ID No. 263	Seq. ID No. 264
135b	Seq. ID No. 265	Seq. ID No. 266
137a	Seq. ID No. 267	Seq. ID No. 268
137b	Seq. ID No. 269	Seq. ID No. 270
138b	Seq. ID No. 273	Seq. ID No. 274
143	Seq. ID No. 277	Seq. ID No. 278
144a	Seq. ID No. 279	Seq. ID No. 280
144b	Seq. ID No. 281	Seq. ID No. 282
144c	Seq. ID No. 283	Seq. ID No. 284
145d	Seq. ID No. 291	Seq. ID No. 292
147	Seq. ID No. 293	Seq. ID No. 294
151b	Seq. ID No. 297	Seq. ID No. 298
152b	Seq. ID No. 301	Seq. ID No. 302
153b	Seq. ID No. 305	Seq. ID No. 306
153c	Seq. ID No. 307	Seq. ID No. 308
154	Seq. ID No. 309	Seq. ID No. 310
155b	Seq. ID No. 313	Seq. ID No. 314
157b	Seq. ID No. 317	Seq. ID No. 318
158b	Seq. ID No. 321	Seq. ID No. 322
160a	Seq. ID No. 323	Seq. ID No. 324
160b	Seq. ID No. 325	Seq. ID No. 326
162c	Seq. ID No. 331	Seq. ID No. 332
162d	Seq. ID No. 333	Seq. ID No. 334
162e	Seq. ID No. 335	Seq. ID No. 336
163	Seq. ID No. 337	Seq. ID No. 338

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
164	Seq. ID No. 339	Seq. ID No. 340
165b	Seq. ID No. 343	Seq. ID No. 344
167	Seq. ID No. 345	Seq. ID No. 346
169	Seq. ID No. 347	Seq. ID No. 348
170	Seq. ID No. 349	Seq. ID No. 350
171b	Seq. ID No. 353	Seq. ID No. 354
172	Seq. ID No. 355	Seq. ID No. 356
173	Seq. ID No. 357	Seq. ID No. 358
174	Seq. ID No. 359	Seq. ID No. 360
175	Seq. ID No. 361	Seq. ID No. 362
176	Seq. ID No. 363	Seq. ID No. 364
177a	Seq. ID No. 365	Seq. ID No. 366
177b	Seq. ID No. 367	Seq. ID No. 368
179a	Seq. ID No. 369	Seq. ID No. 370
179b	Seq. ID No. 371	Seq. ID No. 372
180b	Seq. ID No. 375	Seq. ID No. 376
183a	Seq. ID No. 377	Seq. ID No. 378
184	Seq. ID No. 379	Seq. ID No. 380
186	Seq. ID No. 383	Seq. ID No. 384
187a	Seq. ID No. 385	Seq. ID No. 386
187b	Seq. ID No. 387	Seq. ID No. 388
188	Seq. ID No. 389	Seq. ID No. 390
189b	Seq. ID No. 391	Seq. ID No. 392
191b	Seq. ID No. 393	Seq. ID No. 394
192b	Seq. ID No. 397	Seq. ID No. 398
194a	Seq. ID No. 401	Seq. ID No. 402
194b	Seq. ID No. 403	Seq. ID No. 404
195	Seq. ID No. 405	Seq. ID No. 406
196	Seq. ID No. 407	Seq. ID No. 408

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
197a	Seq. ID No. 409	Seq. ID No. 410
198b	Seq. ID No. 415	Seq. ID No. 416
203	Seq. ID No. 423	Seq. ID No. 424
204	Seq. ID No. 425	Seq. ID No. 426
205	Seq. ID No. 427	Seq. ID No. 428
206	Seq. ID No. 429	Seq. ID No. 430
207	Seq. ID No. 431	Seq. ID No. 432
208a	Seq. ID No. 433	Seq. ID No. 434
208b	Seq. ID No. 435	Seq. ID No. 436
210	Seq. ID No. 437	Seq. ID No. 438
211	Seq. ID No. 439	Seq. ID No. 440
213	Seq. ID No. 441	Seq. ID No. 442
215a	Seq. ID No. 443	Seq. ID No. 444
218	Seq. ID No. 445	Seq. ID No. 446
219	Seq. ID No. 447	Seq. ID No. 448
220b	Seq. ID No. 451	Seq. ID No. 452
220c	Seq. ID No. 453	Seq. ID No. 454
223a	Seq. ID No. 455	Seq. ID No. 456
223b	Seq. ID No. 457	Seq. ID No. 458
226b	Seq. ID No. 461	Seq. ID No. 462
227	Seq. ID No. 463	Seq. ID No. 464
228b	Seq. ID No. 467	Seq. ID No. 468
228c	Seq. ID No. 469	Seq. ID No. 470
228d	Seq. ID No. 471	Seq. ID No. 472
232a	Seq. ID No. 473	Seq. ID No. 474
232b	Seq. ID No. 475	Seq. ID No. 476
235a	Seq. ID No. 477	Seq. ID No. 478
235b	Seq. ID No. 479	Seq. ID No. 480
236a	Seq. ID No. 481	Seq. ID No. 482

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
236b	Seq. ID No. 483	Seq. ID No. 484
236c	Seq. ID No. 485	Seq. ID No. 486
239b	Seq. ID No. 489	Seq. ID No. 490
239c	Seq. ID No. 491	Seq. ID No. 492
240	Seq. ID No. 493	Seq. ID No. 494
241	Seq. ID No. 495	Seq. ID No. 496
245c	Seq. ID No. 501	Seq. ID No. 502
246b	Seq. ID No. 505	Seq. ID No. 506
247	Seq. ID No. 507	Seq. ID No. 508
248b	Seq. ID No. 511	Seq. ID No. 512
249b	Seq. ID No. 515	Seq. ID No. 516
251	Seq. ID No. 517	Seq. ID No. 518
254	Seq. ID No. 523	Seq. ID No. 524
255c	Seq. ID No. 529	Seq. ID No. 530
255d	Seq. ID No. 531	Seq. ID No. 532
258	Seq. ID No. 533	Seq. ID No. 534
259b	Seq. ID No. 537	Seq. ID No. 538
259c	Seq. ID No. 539	Seq. ID No. 540
262	Seq. ID No. 543	Seq. ID No. 544
263b	Seq. ID No. 547	Seq. ID No. 548
264b	Seq. ID No. 549	Seq. ID No. 550
265	Seq. ID No. 551	Seq. ID No. 552
267b	Seq. ID No. 553	Seq. ID No. 554
267c	Seq. ID No. 555	Seq. ID No. 556
268	Seq. ID No. 557	Seq. ID No. 558
269a	Seq. ID No. 559	Seq. ID No. 560
269b	Seq. ID No. 561	Seq. ID No. 562
271b	Seq. ID No. 565	Seq. ID No. 566
273b	Seq. ID No. 569	Seq. ID No. 570



TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
277a	Seq. ID No. 571	Seq. ID No. 572
277b	Seq. ID No. 573	Seq. ID No. 574
277c	Seq. ID No. 575	Seq. ID No. 576
279b	Seq. ID No. 579	Seq. ID No. 580
280a	Seq. ID No. 581	Seq. ID No. 582
280c	Seq. ID No. 585	Seq. ID No. 586
280d	Seq. ID No. 587	Seq. ID No. 588
282	Seq. ID No. 589	Seq. ID No. 590
283a	Seq. ID No. 591	Seq. ID No. 592
283b	Seq. ID No. 593	Seq. ID No. 594
284a	Seq. ID No. 595	Seq. ID No. 596
284b	Seq. ID No. 597	Seq. ID No. 598
285b	Seq. ID No. 599	Seq. ID No. 600
286a	Seq. ID No. 601	Seq. ID No. 602
286b	Seq. ID No. 603	Seq. ID No. 604
287	Seq. ID No. 605	Seq. ID No. 606
290b	Seq. ID No. 609	Seq. ID No. 610
294	Seq. ID No. 613	Seq. ID No. 614
296	Seq. ID No. 615	Seq. ID No. 616
297	Seq. ID No. 617	Seq. ID No. 618
300b	Seq. ID No. 619	Seq. ID No. 620
301a	Seq. ID No. 621	Seq. ID No. 622
301b	Seq. ID No. 623	Seq. ID No. 624
304a	Seq. ID No. 625	Seq. ID No. 626
304b	Seq. ID No. 627	Seq. ID No. 628
310	Seq. ID No. 635	Seq. ID No. 636
311	Seq. ID No. 637	Seq. ID No. 638
313c	Seq. ID No. 643	Seq. ID No. 644
313d	Seq. ID No. 645	Seq. ID No. 646

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
313e	Seq. ID No. 647	Seq. ID No. 648
315	Seq. ID No. 649	Seq. ID No. 650
317b	Seq. ID No. 655	Seq. ID No. 656
318d	Seq. ID No. 663	Seq. ID No. 664
318e	Seq. ID No. 665	Seq. ID No. 666
320	Seq. ID No. 667	Seq. ID No. 668
321	Seq. ID No. 669	Seq. ID No. 670
324	Seq. ID No. 675	Seq. ID No. 676
327c	Seq. ID No. 681	Seq. ID No. 682
329	Seq. ID No. 683	Seq. ID No. 684
330b	Seq. ID No. 687	Seq. ID No. 688
330c	Seq. ID No. 689	Seq. ID No. 690
331	Seq. ID No. 691	Seq. ID No. 692
333	Seq. ID No. 695	Seq. ID No. 696
334	Seq. ID No. 697	Seq. ID No. 698
335a	Seq. ID No. 699	Seq. ID No. 700
335b	Seq. ID No. 701	Seq. ID No. 702
337	Seq. ID No. 703	Seq. ID No. 704
338a	Seq. ID No. 705	Seq. ID No. 706
338b	Seq. ID No. 707	Seq. ID No. 708
338c	Seq. ID No. 709	Seq. ID No. 710
341b	Seq. ID No. 713	Seq. ID No. 714
342f	Seq. ID No. 725	Seq. ID No. 726
342g	Seq. ID No. 727	Seq. ID No. 728
342h	Seq. ID No. 729	Seq. ID No. 730
344a	Seq. ID No. 731	Seq. ID No. 732
344b	Seq. ID No. 733	Seq. ID No. 734
345	Seq. ID No. 735	Seq. ID No. 736
346b	Seq. ID No. 739	Seq. ID No. 740

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
347	Seq. ID No. 741	Seq. ID No. 742
349b	Seq. ID No. 745	Seq. ID No. 746
349c	Seq. ID No. 747	Seq. ID No. 748
350a	Seq. ID No. 749	Seq. ID No. 750
350b	Seq. ID No. 751	Seq. ID No. 752
351	Seq. ID No. 753	Seq. ID No. 754
352c	Seq. ID No. 759	Seq. ID No. 760
354b	Seq. ID No. 763	Seq. ID No. 764
354c	Seq. ID No. 765	Seq. ID No. 766
356c	Seq. ID No. 773	Seq. ID No. 774
356d	Seq. ID No. 775	Seq. ID No. 776
358c	Seq. ID No. 781	Seq. ID No. 782
362	Seq. ID No. 783	Seq. ID No. 784
365b	Seq. ID No. 787	Seq. ID No. 788
367a	Seq. ID No. 793	Seq. ID No. 794
367b	Seq. ID No. 795	Seq. ID No. 796
371b	Seq. ID No. 799	Seq. ID No. 800
372a	Seq. ID No. 801	Seq. ID No. 802
372c	Seq. ID No. 805	Seq. ID No. 806
372d	Seq. ID No. 807	Seq. ID No. 808
374	Seq. ID No. 809	Seq. ID No. 810
377a	Seq. ID No. 811	Seq. ID No. 812
377b	Seq. ID No. 813	Seq. ID No. 814
378a	Seq. ID No. 815	Seq. ID No. 816
378b	Seq. ID No. 817	Seq. ID No. 818
382b	Seq. ID No. 819	Seq. ID No. 820
383a	Seq. ID No. 821	Seq. ID No. 822
383b	Seq. ID No. 823	Seq. ID No. 824
384b	Seq. ID No. 827	Seq. ID No. 828

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
385a	Seq. ID No. 829	Seq. ID No. 830
385b	Seq. ID No. 831	Seq. ID No. 832
387	Seq. ID No. 835	Seq. ID No. 836
390	Seq. ID No. 837	Seq. ID No. 838
391	Seq. ID No. 839	Seq. ID No. 840
395a	Seq. ID No. 843	Seq. ID No. 844
395b	Seq. ID No. 845	Seq. ID No. 846
395c	Seq. ID No. 847	Seq. ID No. 848
400b	Seq. ID No. 855	Seq. ID No. 856
401b	Seq. ID No. 859	Seq. ID No. 860
403a	Seq. ID No. 861	Seq. ID No. 862
403c	Seq. ID No. 865	Seq. ID No. 866
403d	Seq. ID No. 867	Seq. ID No. 868
406b	Seq. ID No. 871	Seq. ID No. 872
409a	Seq. ID No. 873	Seq. ID No. 874
409b	Seq. ID No. 875	Seq. ID No. 876
410a	Seq. ID No. 877	Seq. ID No. 878
410b	Seq. ID No. 879	Seq. ID No. 880
410c	Seq. ID No. 881	Seq. ID No. 882
413b	Seq. ID No. 885	Seq. ID No. 886
418b	Seq. ID No. 895	Seq. ID No. 896
419a	Seq. ID No. 897	Seq. ID No. 898
419b	Seq. ID No. 899	Seq. ID No. 900
419c	Seq. ID No. 901	Seq. ID No. 902
420a	Seq. ID No. 903	Seq. ID No. 904
420b	Seq. ID No. 905	Seq. ID No. 906
421	Seq. ID No. 907	Seq. ID No. 908
422	Seq. ID No. 909	Seq. ID No. 910
424b	Seq. ID No. 913	Seq. ID No. 914

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
424c	Seq. ID No. 915	Seq. ID No. 916
427a	Seq. ID No. 921	Seq. ID No. 922
427b	Seq. ID No. 923	Seq. ID No. 924
427c	Seq. ID No. 925	Seq. ID No. 926
429c	Seq. ID No. 931	Seq. ID No. 932
429d	Seq. ID No. 933	Seq. ID No. 934
431	Seq. ID No. 935	Seq. ID No. 936
434	Seq. ID No. 937	Seq. ID No. 938
435	Seq. ID No. 939	Seq. ID No. 940
437b	Seq. ID No. 941	Seq. ID No. 942
437c	Seq. ID No. 943	Seq. ID No. 944
438b	Seq. ID No. 947	Seq. ID No. 948
438c	Seq. ID No. 949	Seq. ID No. 950
440	Seq. ID No. 951	Seq. ID No. 952
441a	Seq. ID No. 953	Seq. ID No. 954
441b	Seq. ID No. 955	Seq. ID No. 956
443b	Seq. ID No. 957	Seq. ID No. 958
444b	Seq. ID No. 961	Seq. ID No. 962
445a	Seq. ID No. 963	Seq. ID No. 964
445b	Seq. ID No. 965	Seq. ID No. 966
448	Seq. ID No. 967	Seq. ID No. 968
450a	Seq. ID No. 969	Seq. ID No. 970
450b	Seq. ID No. 971	Seq. ID No. 972
451a	Seq. ID No. 973	Seq. ID No. 974
451b	Seq. ID No. 975	Seq. ID No. 976
452c	Seq. ID No. 981	Seq. ID No. 982
452d	Seq. ID No. 983	Seq. ID No. 984
452e	Seq. ID No. 985	Seq. ID No. 986
454b	Seq. ID No. 987	Seq. ID No. 988

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
455a	Seq. ID No. 989	Seq. ID No. 990
455b	Seq. ID No. 991	Seq. ID No. 992
455c	Seq. ID No. 993	Seq. ID No. 994
458a	Seq. ID No. 995	Seq. ID No. 996
458b	Seq. ID No. 997	Seq. ID No. 998
460b	Seq. ID No. 1001	Seq. ID No. 1002
460c	Seq. ID No. 1003	Seq. ID No. 1004
462	Seq. ID No. 1005	Seq. ID No. 1006
463a	Seq. ID No. 1007	Seq. ID No. 1008
463b	Seq. ID No. 1009	Seq. ID No. 1010
464d	Seq. ID No. 1017	Seq. ID No. 1018
465b	Seq. ID No. 1019	Seq. ID No. 1020
467b	Seq. ID No. 1023	Seq. ID No. 1024
471a	Seq. ID No. 1025	Seq. ID No. 1026
471b	Seq. ID No. 1027	Seq. ID No. 1028
472f	Seq. ID No. 1039	Seq. ID No. 1040
473	Seq. ID No. 1041	Seq. ID No. 1042
474	Seq. ID No. 1043	Seq. ID No. 1044
476	Seq. ID No. 1045	Seq. ID No. 1046
477b	Seq. ID No. 1047	Seq. ID No. 1048
478a	Seq. ID No. 1049	Seq. ID No. 1050
478b	Seq. ID No. 1051	Seq. ID No. 1052
480b	Seq. ID No. 1057	Seq. ID No. 1058
481a	Seq. ID No. 1059	Seq. ID No. 1060
481b	Seq. ID No. 1061	Seq. ID No. 1062
482b	Seq. ID No. 1065	Seq. ID No. 1066
490	Seq. ID No. 1069	Seq. ID No. 1070
492	Seq. ID No. 1075	Seq. ID No. 1076
494a	Seq. ID No. 1077	Seq. ID No. 1078

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
495a	Seq. ID No. 1079	Seq. ID No. 1080
495b	Seq. ID No. 1081	Seq. ID No. 1082
495c	Seq. ID No. 1083	Seq. ID No. 1084
498a	Seq. ID No. 1085	Seq. ID No. 1086
498b	Seq. ID No. 1087	Seq. ID No. 1088
499b	Seq. ID No. 1091	Seq. ID No. 1092
500	Seq. ID No. 1093	Seq. ID No. 1094
502b	Seq. ID No. 1095	Seq. ID No. 1096
502c	Seq. ID No. 1097	Seq. ID No. 1098
504	Seq. ID No. 1099	Seq. ID No. 1100
505a	Seq. ID No. 1101	Seq. ID No. 1102
505b	Seq. ID No. 1103	Seq. ID No. 1104
507b	Seq. ID No. 1107	Seq. ID No. 1108
509	Seq. ID No. 1109	Seq. ID No. 1110
510	Seq. ID No. 1111	Seq. ID No. 1112
512a	Seq. ID No. 1113	Seq. ID No. 1114
512b	Seq. ID No. 1115	Seq. ID No. 1116
515a	Seq. ID No. 1119	Seq. ID No. 1120
515b	Seq. ID No. 1121	Seq. ID No. 1122
515c	Seq. ID No. 1123	Seq. ID No. 1124
518a	Seq. ID No. 1125	Seq. ID No. 1126
518b	Seq. ID No. 1127	Seq. ID No. 1128
518c	Seq. ID No. 1129	Seq. ID No. 1130
521b	Seq. ID No. 1131	Seq. ID No. 1132
524b	Seq. ID No. 1137	Seq. ID No. 1138
525	Seq. ID No. 1139	Seq. ID No. 1140
527a	Seq. ID No. 1141	Seq. ID No. 1142
527b	Seq. ID No. 1143	Seq. ID No. 1144
528a	Seq. ID No. 1145	Seq. ID No. 1146

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
528b	Seq. ID No. 1147	Seq. ID No. 1148
529	Seq. ID No. 1149	Seq. ID No. 1150
530a	Seq. ID No. 1151	Seq. ID No. 1152
530b	Seq. ID No. 1153	Seq. ID No. 1154
533	Seq. ID No. 1155	Seq. ID No. 1156
535	Seq. ID No. 1157	Seq. ID No. 1158
536	Seq. ID No. 1159	Seq. ID No. 1160
539b	Seq. ID No. 1161	Seq. ID No. 1162
539c	Seq. ID No. 1163	Seq. ID No. 1164
541d	Seq. ID No. 1171	Seq. ID No. 1172
543a	Seq. ID No. 1175	Seq. ID No. 1176
543b	Seq. ID No. 1177	Seq. ID No. 1178
543c	Seq. ID No. 1179	Seq. ID No. 1180
544	Seq. ID No. 1181	Seq. ID No. 1182
545c	Seq. ID No. 1187	Seq. ID No. 1188
546b	Seq. ID No. 1191	Seq. ID No. 1192
546c	Seq. ID No. 1193	Seq. ID No. 1194
547a	Seq. ID No. 1195	Seq. ID No. 1196
547b	Seq. ID No. 1197	Seq. ID No. 1198
549b	Seq. ID No. 1201	Seq. ID No. 1202
550a	Seq. ID No. 1203	Seq. ID No. 1204
551	Seq. ID No. 1205	Seq. ID No. 1206
553c	Seq. ID No. 1207	Seq. ID No. 1208
554b	Seq. ID No. 1211	Seq. ID No. 1212
556	Seq. ID No. 1213	Seq. ID No. 1214
557a	Seq. ID No. 1215	Seq. ID No. 1216
557b	Seq. ID No. 1217	Seq. ID No. 1218
560b	Seq. ID No. 1221	Seq. ID No. 1222
561	Seq. ID No. 1223	Seq. ID No. 1224



TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
563	Seq. ID No. 1225	Seq. ID No. 1226
564c	Seq. ID No. 1231	Seq. ID No. 1232
569	Seq. ID No. 1233	Seq. ID No. 1234
570b	Seq. ID No. 1237	Seq. ID No. 1238
571	Seq. ID No. 1239	Seq. ID No. 1240
573	Seq. ID No. 1241	Seq. ID No. 1242
576b	Seq. ID No. 1245	Seq. ID No. 1246
578a	Seq. ID No. 1247	Seq. ID No. 1248
578b	Seq. ID No. 1249	Seq. ID No. 1250
580a	Seq. ID No. 1251	Seq. ID No. 1252
580b	Seq. ID No. 1253	Seq. ID No. 1254
583a	Seq. ID No. 1255	Seq. ID No. 1256
583b	Seq. ID No. 1257	Seq. ID No. 1258
585b	Seq. ID No. 1259	Seq. ID No. 1260
586a	Seq. ID No. 1261	Seq. ID No. 1262
586b	Seq. ID No. 1263	Seq. ID No. 1264
587d	Seq. ID No. 1271	Seq. ID No. 1272
588a	Seq. ID No. 1273	Seq. ID No. 1274
588b	Seq. ID No. 1275	Seq. ID No. 1276
589a	Seq. ID No. 1277	Seq. ID No. 1278
589b	Seq. ID No. 1279	Seq. ID No. 1280
595b	Seq. ID No. 1285	Seq. ID No. 1286
596b	Seq. ID No. 1289	Seq. ID No. 1290
596c	Seq. ID No. 1291	Seq. ID No. 1292
597	Seq. ID No. 1293	Seq. ID No. 1294
598a	Seq. ID No. 1295	Seq. ID No. 1296
598b	Seq. ID No. 1297	Seq. ID No. 1298
599a	Seq. ID No. 1299	Seq. ID No. 1300
599b	Seq. ID No. 1301	Seq. ID No. 1302

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
600a	Seq. ID No. 1303	Seq. ID No. 1304
600b	Seq. ID No. 1305	Seq. ID No. 1306
603a	Seq. ID No. 1307	Seq. ID No. 1308
606	Seq. ID No. 1309	Seq. ID No. 1310
607a	Seq. ID No. 1311	Seq. ID No. 1312
607b	Seq. ID No. 1313	Seq. ID No. 1314
609b	Seq. ID No. 1317	Seq. ID No. 1318
610a	Seq. ID No. 1319	Seq. ID No. 1320
610b	Seq. ID No. 1321	Seq. ID No. 1322
613d	Seq. ID No. 1331	Seq. ID No. 1332
614a	Seq. ID No. 1333	Seq. ID No. 1334
614b	Seq. ID No. 1335	Seq. ID No. 1336
615b	Seq. ID No. 1337	Seq. ID No. 1338
618	Seq. ID No. 1339	Seq. ID No. 1340
619b	Seq. ID No. 1343	Seq. ID No. 1344
620	Seq. ID No. 1345	Seq. ID No. 1346
623	Seq. ID No. 1347	Seq. ID No. 1348
624a	Seq. ID No. 1349	Seq. ID No. 1350
624b	Seq. ID No. 1351	Seq. ID No. 1352
626b	Seq. ID No. 1359	Seq. ID No. 1360
626c	Seq. ID No. 1361	Seq. ID No. 1362
631a	Seq. ID No. 1363	Seq. ID No. 1364
631b	Seq. ID No. 1365	Seq. ID No. 1366
631d	Seq. ID No. 1369	Seq. ID No. 1370
632b	Seq. ID No. 1371	Seq. ID No. 1372
633b	Seq. ID No. 1375	Seq. ID No. 1376
633c	Seq. ID No. 1377	Seq. ID No. 1378
636	Seq. ID No. 1381	Seq. ID No. 1382
637a	Seq. ID No. 1383	Seq. ID No. 1384

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
637b	Seq. ID No. 1385	Seq. ID No. 1386
637c	Seq. ID No. 1387	Seq. ID No. 1388
640	Seq. ID No. 1389	Seq. ID No. 1390
641a	Seq. ID No. 1391	Seq. ID No. 1392
641b	Seq. ID No. 1393	Seq. ID No. 1394
645	Seq. ID No. 1401	Seq. ID No. 1402
650	Seq. ID No. 1403	Seq. ID No. 1404
653a	Seq. ID No. 1407	Seq. ID No. 1408
653b	Seq. ID No. 1409	Seq. ID No. 1410
653c	Seq. ID No. 1411	Seq. ID No. 1412
656	Seq. ID No. 1413	Seq. ID No. 1414
657c	Seq. ID No. 1415	Seq. ID No. 1416
658b	Seq. ID No. 1419	Seq. ID No. 1420
659a	Seq. ID No. 1421	Seq. ID No. 1422
659b	Seq. ID No. 1423	Seq. ID No. 1424
661	Seq. ID No. 1425	Seq. ID No. 1426
663	Seq. ID No. 1427	Seq. ID No. 1428
665	Seq. ID No. 1429	Seq. ID No. 1430
670	Seq. ID No. 1433	Seq. ID No. 1434
674b	Seq. ID No. 1437	Seq. ID No. 1438
677a	Seq. ID No. 1441	Seq. ID No. 1442
677b	Seq. ID No. 1443	Seq. ID No. 1444
679b	Seq. ID No. 1447	Seq. ID No. 1448
680	Seq. ID No. 1449	Seq. ID No. 1450
681	Seq. ID No. 1451	Seq. ID No. 1452
683b	Seq. ID No. 1455	Seq. ID No. 1456
687	Seq. ID No. 1459	Seq. ID No. 1460
688b	Seq. ID No. 1463	Seq. ID No. 1464
690	Seq. ID No. 1465	Seq. ID No. 1466

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
691a	Seq. ID No. 1467	Seq. ID No. 1468
691b	Seq. ID No. 1469	Seq. ID No. 1470
692	Seq. ID No. 1471	Seq. ID No. 1472
694	Seq. ID No. 1473	Seq. ID No. 1474
696	Seq. ID No. 1475	Seq. ID No. 1476
698	Seq. ID No. 1477	Seq. ID No. 1478
699b	Seq. ID No. 1479	Seq. ID No. 1480
700b	Seq. ID No. 1483	Seq. ID No. 1484
700c	Seq. ID No. 1485	Seq. ID No. 1486
703	Seq. ID No. 1487	Seq. ID No. 1488
705b	Seq. ID No. 1491	Seq. ID No. 1492
707	Seq. ID No. 1493	Seq. ID No. 1494
709	Seq. ID No. 1495	Seq. ID No. 1496
710	Seq. ID No. 1497	Seq. ID No. 1498
712a	Seq. ID No. 1499	Seq. ID No. 1500
712b	Seq. ID No. 1501	Seq. ID No. 1502
715b	Seq. ID No. 1505	Seq. ID No. 1506
717	Seq. ID No. 1507	Seq. ID No. 1508
721	Seq. ID No. 1511	Seq. ID No. 1512
722c	Seq. ID No. 1517	Seq. ID No. 1518
724a	Seq. ID No. 1519	Seq. ID No. 1520
724c	Seq. ID No. 1523	Seq. ID No. 1524
724d	Seq. ID No. 1525	Seq. ID No. 1526
726	Seq. ID No. 1527	Seq. ID No. 1528
728b	Seq. ID No. 1531	Seq. ID No. 1532
730d	Seq. ID No. 1539	Seq. ID No. 1540
732	Seq. ID No. 1543	Seq. ID No. 1544
738c	Seq. ID No. 1549	Seq. ID No. 1550
739	Seq. ID No. 1551	Seq. ID No. 1552

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
740	Seq. ID No. 1553	Seq. ID No. 1554
741a	Seq. ID No. 1555	Seq. ID No. 1556
741b	Seq. ID No. 1557	Seq. ID No. 1558
743b	Seq. ID No. 1561	Seq. ID No. 1562
744	Seq. ID No. 1563	Seq. ID No. 1564
745a	Seq. ID No. 1565	Seq. ID No. 1566
745b	Seq. ID No. 1567	Seq. ID No. 1568
746b	Seq. ID No. 1571	Seq. ID No. 1572
747	Seq. ID No. 1573	Seq. ID No. 1574
748a	Seq. ID No. 1575	Seq. ID No. 1576
748b	Seq. ID No. 1577	Seq. ID No. 1578
749	Seq. ID No. 1579	Seq. ID No. 1580
751	Seq. ID No. 1581	Seq. ID No. 1582
754d	Seq. ID No. 1589	Seq. ID No. 1590
756b	Seq. ID No. 1593	Seq. ID No. 1594
758	Seq. ID No. 1595	Seq. ID No. 1596
760	Seq. ID No. 1597	Seq. ID No. 1598
762a	Seq. ID No. 1599	Seq. ID No. 1600
762b	Seq. ID No. 1601	Seq. ID No. 1602
763b	Seq. ID No. 1607	Seq. ID No. 1608
766	Seq. ID No. 1611	Seq. ID No. 1612
767	Seq. ID No. 1613	Seq. ID No. 1614
770a	Seq. ID No. 1615	Seq. ID No. 1616
770b	Seq. ID No. 1617	Seq. ID No. 1618
770c	Seq. ID No. 1619	Seq. ID No. 1620
772b	Seq. ID No. 1623	Seq. ID No. 1624
774	Seq. ID No. 1625	Seq. ID No. 1626
775	Seq. ID No. 1627	Seq. ID No. 1628
779	Seq. ID No. 1633	Seq. ID No. 1634

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
780b	Seq. ID No. 1637	Seq. ID No. 1638
782b	Seq. ID No. 1639	Seq. ID No. 1640
785	Seq. ID No. 1641	Seq. ID No. 1642
786b	Seq. ID No. 1643	Seq. ID No. 1644
788b	Seq. ID No. 1647	Seq. ID No. 1648
789b	Seq. ID No. 1651	Seq. ID No. 1652
789c	Seq. ID No. 1653	Seq. ID No. 1654
791	Seq. ID No. 1655	Seq. ID No. 1656
792	Seq. ID No. 1657	Seq. ID No. 1658
794b	Seq. ID No. 1661	Seq. ID No. 1662
794c	Seq. ID No. 1663	Seq. ID No. 1664
794d	Seq. ID No. 1665	Seq. ID No. 1666
797	Seq. ID No. 1669	Seq. ID No. 1670
799c	Seq. ID No. 1675	Seq. ID No. 1676
799e	Seq. ID No. 1679	Seq. ID No. 1680
799f	Seq. ID No. 1681	Seq. ID No. 1682
803b	Seq. ID No. 1685	Seq. ID No. 1686
804a	Seq. ID No. 1687	Seq. ID No. 1688
804b	Seq. ID No. 1689	Seq. ID No. 1690
807	Seq. ID No. 1691	Seq. ID No. 1692
808	Seq. ID No. 1693	Seq. ID No. 1694
809b	Seq. ID No. 1695	Seq. ID No. 1696
812	Seq. ID No. 1697	Seq. ID No. 1698
813	Seq. ID No. 1699	Seq. ID No. 1700
820a	Seq. ID No. 1703	Seq. ID No. 1704
820b	Seq. ID No. 1705	Seq. ID No. 1706
826	Seq. ID No. 1707	Seq. ID No. 1708
829b	Seq. ID No. 1711	Seq. ID No. 1712
830	Seq. ID No. 1713	Seq. ID No. 1714

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
834a	Seq. ID No. 1715	Seq. ID No. 1716
834b	Seq. ID No. 1717	Seq. ID No. 1718
834c	Seq. ID No. 1719	Seq. ID No. 1720
835a	Seq. ID No. 1721	Seq. ID No. 1722
835b	Seq. ID No. 1723	Seq. ID No. 1724
836b	Seq. ID No. 1727	Seq. ID No. 1728
836c	Seq. ID No. 1729	Seq. ID No. 1730
837c	Seq. ID No. 1735	Seq. ID No. 1736
843	Seq. ID No. 1737	Seq. ID No. 1738
847a	Seq. ID No. 1739	Seq. ID No. 1740
847b	Seq. ID No. 1741	Seq. ID No. 1742
849b	Seq. ID No. 1747	Seq. ID No. 1748
851a	Seq. ID No. 1749	Seq. ID No. 1750
851b	Seq. ID No. 1751	Seq. ID No. 1752
853b	Seq. ID No. 1755	Seq. ID No. 1756
853c	Seq. ID No. 1757	Seq. ID No. 1758
854	Seq. ID No. 1759	Seq. ID No. 1760
857	Seq. ID No. 1763	Seq. ID No. 1764
859c	Seq. ID No. 1769	Seq. ID No. 1770
859d	Seq. ID No. 1771	Seq. ID No. 1772
862	Seq. ID No. 1775	Seq. ID No. 1776
863	Seq. ID No. 1777	Seq. ID No. 1778
864a	Seq. ID No. 1779	Seq. ID No. 1780
864b	Seq. ID No. 1781	Seq. ID No. 1782
866a	Seq. ID No. 1783	Seq. ID No. 1784
866b	Seq. ID No. 1785	Seq. ID No. 1786
868b	Seq. ID No. 1789	Seq. ID No. 1790
870	Seq. ID No. 1791	Seq. ID No. 1792
873a	Seq. ID No. 1793	Seq. ID No. 1794

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
873b	Seq. ID No. 1795	Seq. ID No. 1796
873c	Seq. ID No. 1797	Seq. ID No. 1798
876	Seq. ID No. 1805	Seq. ID No. 1806
878b	Seq. ID No. 1809	Seq. ID No. 1810
878c	Seq. ID No. 1811	Seq. ID No. 1812
880a	Seq. ID No. 1813	Seq. ID No. 1814
880b	Seq. ID No. 1815	Seq. ID No. 1816
880c	Seq. ID No. 1817	Seq. ID No. 1818
885	Seq. ID No. 1819	Seq. ID No. 1820
886	Seq. ID No. 1821	Seq. ID No. 1822
887	Seq. ID No. 1823	Seq. ID No. 1824
888	Seq. ID No. 1825	Seq. ID No. 1826
890b	Seq. ID No. 1829	Seq. ID No. 1830
904	Seq. ID No. 1833	Seq. ID No. 1834
908b	Seq. ID No. 1841	Seq. ID No. 1842
908c	Seq. ID No. 1843	Seq. ID No. 1844
911	Seq. ID No. 1845	Seq. ID No. 1846
912	Seq. ID No. 1847	Seq. ID No. 1848
916	Seq. ID No. 1849	Seq. ID No. 1850
918b	Seq. ID No. 1853	Seq. ID No. 1854
918c	Seq. ID No. 1855	Seq. ID No. 1856
919	Seq. ID No. 1857	Seq. ID No. 1858
923	Seq. ID No. 1859	Seq. ID No. 1860
925a	Seq. ID No. 1861	Seq. ID No. 1862
925b	Seq. ID No. 1863	Seq. ID No. 1864
926	Seq. ID No. 1865	Seq. ID No. 1866
927	Seq. ID No. 1867	Seq. ID No. 1868
929b	Seq. ID No. 1871	Seq. ID No. 1872
930	Seq. ID No. 1873	Seq. ID No. 1874



TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
931	Seq. ID No. 1875	Seq. ID No. 1876
932	Seq. ID No. 1877	Seq. ID No. 1878
934b	Seq. ID No. 1881	Seq. ID No. 1882
934c	Seq. ID No. 1883	Seq. ID No. 1884
934d	Seq. ID No. 1885	Seq. ID No. 1886
935	Seq. ID No. 1887	Seq. ID No. 1888
938	Seq. ID No. 1889	Seq. ID No. 1890
939c	Seq. ID No. 1895	Seq. ID No. 1896
944b	Seq. ID No. 1903	Seq. ID No. 1904
946	Seq. ID No. 1905	Seq. ID No. 1906
949a	Seq. ID No. 1907	Seq. ID No. 1908
949c	Seq. ID No. 1911	Seq. ID No. 1912
949d	Seq. ID No. 1913	Seq. ID No. 1914
950	Seq. ID No. 1915	Seq. ID No. 1916
951b	Seq. ID No. 1919	Seq. ID No. 1920
952b	Seq. ID No. 1923	Seq. ID No. 1924
954	Seq. ID No. 1925	Seq. ID No. 1926
955a	Seq. ID No. 1927	Seq. ID No. 1928
955b	Seq. ID No. 1929	Seq. ID No. 1930
956	Seq. ID No. 1931	Seq. ID No. 1932
958b	Seq. ID No. 1935	Seq. ID No. 1936
961b	Seq. ID No. 1941	Seq. ID No. 1942
961c	Seq. ID No. 1943	Seq. ID No. 1944
963	Seq. ID No. 1945	Seq. ID No. 1946
965a	Seq. ID No. 1947	Seq. ID No. 1948
965b	Seq. ID No. 1949	Seq. ID No. 1950
966a	Seq. ID No. 1951	Seq. ID No. 1952
966b	Seq. ID No. 1953	Seq. ID No. 1954
968	Seq. ID No. 1959	Seq. ID No. 1960

**TABLE 20: WYETH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
969	Seq. ID No. 1961	Seq. ID No. 1962
972a	Seq. ID No. 1963	Seq. ID No. 1964
972b	Seq. ID No. 1965	Seq. ID No. 1966
976	Seq. ID No. 1967	Seq. ID No. 1968
977a	Seq. ID No. 1969	Seq. ID No. 1970
977b	Seq. ID No. 1971	Seq. ID No. 1972
980	Seq. ID No. 1979	Seq. ID No. 1980
982	Seq. ID No. 1983	Seq. ID No. 1984
984a	Seq. ID No. 1985	Seq. ID No. 1986
984b	Seq. ID No. 1987	Seq. ID No. 1988
986	Seq. ID No. 1989	Seq. ID No. 1990
987	Seq. ID No. 1991	Seq. ID No. 1992
988b	Seq. ID No. 1995	Seq. ID No. 1996
988c	Seq. ID No. 1997	Seq. ID No. 1998
988d	Seq. ID No. 1999	Seq. ID No. 2000
991	Seq. ID No. 2001	Seq. ID No. 2002
992	Seq. ID No. 2003	Seq. ID No. 2004
993	Seq. ID No. 2005	Seq. ID No. 2006
994	Seq. ID No. 2007	Seq. ID No. 2008
998b	Seq. ID No. 2015	Seq. ID No. 2016
999b	Seq. ID No. 2019	Seq. ID No. 2020
1000	Seq. ID No. 2021	Seq. ID No. 2022
1003a	Seq. ID No. 2025	Seq. ID No. 2026
1003b	Seq. ID No. 2027	Seq. ID No. 2028
1004a	Seq. ID No. 2029	Seq. ID No. 2030
1004b	Seq. ID No. 2031	Seq. ID No. 2032
1006b	Seq. ID No. 2035	Seq. ID No. 2036
1007	Seq. ID No. 2037	Seq. ID No. 2038
1013a	Seq. ID No. 2041	Seq. ID No. 2042

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1013b	Seq. ID No. 2043	Seq. ID No. 2044
1013c	Seq. ID No. 2045	Seq. ID No. 2046
1016c	Seq. ID No. 2047	Seq. ID No. 2048
1017c	Seq. ID No. 2053	Seq. ID No. 2054
1017d	Seq. ID No. 2055	Seq. ID No. 2056
1018b	Seq. ID No. 2059	Seq. ID No. 2060
1021b	Seq. ID No. 2063	Seq. ID No. 2064
1021c	Seq. ID No. 2065	Seq. ID No. 2066
1024	Seq. ID No. 2067	Seq. ID No. 2068
1025	Seq. ID No. 2069	Seq. ID No. 2070
1026	Seq. ID No. 2071	Seq. ID No. 2072
1029	Seq. ID No. 2073	Seq. ID No. 2074
1033a	Seq. ID No. 2075	Seq. ID No. 2076
1033b	Seq. ID No. 2077	Seq. ID No. 2078
1033c	Seq. ID No. 2079	Seq. ID No. 2080
1035a	Seq. ID No. 2081	Seq. ID No. 2082
1035b	Seq. ID No. 2083	Seq. ID No. 2084
1035c	Seq. ID No. 2085	Seq. ID No. 2086
1036b	Seq. ID No. 2089	Seq. ID No. 2090
1036c	Seq. ID No. 2091	Seq. ID No. 2092
1037	Seq. ID No. 2093	Seq. ID No. 2094
1039b	Seq. ID No. 2097	Seq. ID No. 2098
1041	Seq. ID No. 2099	Seq. ID No. 2100
1042a	Seq. ID No. 2101	Seq. ID No. 2102
1042b	Seq. ID No. 2103	Seq. ID No. 2104
1044b	Seq. ID No. 2107	Seq. ID No. 2108
1044c	Seq. ID No. 2109	Seq. ID No. 2110
1044d	Seq. ID No. 2111	Seq. ID No. 2112
1047b	Seq. ID No. 2115	Seq. ID No. 2116

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1049a	Seq. ID No. 2117	Seq. ID No. 2118
1049b	Seq. ID No. 2119	Seq. ID No. 2120
1050c	Seq. ID No. 2125	Seq. ID No. 2126
1050d	Seq. ID No. 2127	Seq. ID No. 2128
1055	Seq. ID No. 2129	Seq. ID No. 2130
1056a	Seq. ID No. 2131	Seq. ID No. 2132
1056b	Seq. ID No. 2133	Seq. ID No. 2134
1057	Seq. ID No. 2135	Seq. ID No. 2136
1058	Seq. ID No. 2137	Seq. ID No. 2138
1060b	Seq. ID No. 2141	Seq. ID No. 2142
1062	Seq. ID No. 2143	Seq. ID No. 2144
1063	Seq. ID No. 2145	Seq. ID No. 2146
1065a	Seq. ID No. 2149	Seq. ID No. 2150
1065b	Seq. ID No. 2151	Seq. ID No. 2152
1065c	Seq. ID No. 2153	Seq. ID No. 2154
1066a	Seq. ID No. 2155	Seq. ID No. 2156
1066b	Seq. ID No. 2157	Seq. ID No. 2158
1067	Seq. ID No. 2159	Seq. ID No. 2160
1069	Seq. ID No. 2161	Seq. ID No. 2162
1070b	Seq. ID No. 2165	Seq. ID No. 2166
1076a	Seq. ID No. 2167	Seq. ID No. 2168
1076b	Seq. ID No. 2169	Seq. ID No. 2170
1077e	Seq. ID No. 2179	Seq. ID No. 2180
1079a	Seq. ID No. 2181	Seq. ID No. 2182
1079b	Seq. ID No. 2183	Seq. ID No. 2184
1081b	Seq. ID No. 2189	Seq. ID No. 2190
1082	Seq. ID No. 2191	Seq. ID No. 2192
1086	Seq. ID No. 2195	Seq. ID No. 2196
1087a	Seq. ID No. 2197	Seq. ID No. 2198

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1087b	Seq. ID No. 2199	Seq. ID No. 2200
1091a	Seq. ID No. 2201	Seq. ID No. 2202
1091b	Seq. ID No. 2203	Seq. ID No. 2204
1094a	Seq. ID No. 2205	Seq. ID No. 2206
1094b	Seq. ID No. 2207	Seq. ID No. 2208
1095a	Seq. ID No. 2209	Seq. ID No. 2210
1095b	Seq. ID No. 2211	Seq. ID No. 2212
1096a	Seq. ID No. 2213	Seq. ID No. 2214
1096b	Seq. ID No. 2215	Seq. ID No. 2216
1096c	Seq. ID No. 2217	Seq. ID No. 2218
1098b	Seq. ID No. 2221	Seq. ID No. 2222
1100	Seq. ID No. 2223	Seq. ID No. 2224
1101b	Seq. ID No. 2227	Seq. ID No. 2228
1104	Seq. ID No. 2229	Seq. ID No. 2230
1108b	Seq. ID No. 2235	Seq. ID No. 2236
1111c	Seq. ID No. 2241	Seq. ID No. 2242
1125	Seq. ID No. 2245	Seq. ID No. 2246
1126a	Seq. ID No. 2247	Seq. ID No. 2248
1126c	Seq. ID No. 2251	Seq. ID No. 2252
1127	Seq. ID No. 2253	Seq. ID No. 2254
1131	Seq. ID No. 2257	Seq. ID No. 2258
1132	Seq. ID No. 2259	Seq. ID No. 2260
1135a	Seq. ID No. 2261	Seq. ID No. 2262
1135b	Seq. ID No. 2263	Seq. ID No. 2264
1136a	Seq. ID No. 2265	Seq. ID No. 2266
1136b	Seq. ID No. 2267	Seq. ID No. 2268
1138	Seq. ID No. 2269	Seq. ID No. 2270
1140c	Seq. ID No. 2275	Seq. ID No. 2276
1141a	Seq. ID No. 2277	Seq. ID No. 2278

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1141b	Seq. ID No. 2279	Seq. ID No. 2280
1144b	Seq. ID No. 2285	Seq. ID No. 2286
1144c	Seq. ID No. 2287	Seq. ID No. 2288
1146e	Seq. ID No. 2297	Seq. ID No. 2298
1148	Seq. ID No. 2299	Seq. ID No. 2300
1149	Seq. ID No. 2301	Seq. ID No. 2302
1152d	Seq. ID No. 2309	Seq. ID No. 2310
1152e	Seq. ID No. 2311	Seq. ID No. 2312
1152g	Seq. ID No. 2315	Seq. ID No. 2316
1155f	Seq. ID No. 2327	Seq. ID No. 2328
1155g	Seq. ID No. 2329	Seq. ID No. 2330
1158b	Seq. ID No. 2333	Seq. ID No. 2334
1165	Seq. ID No. 2343	Seq. ID No. 2344
1166	Seq. ID No. 2345	Seq. ID No. 2346
1167b	Seq. ID No. 2349	Seq. ID No. 2350
1168	Seq. ID No. 2351	Seq. ID No. 2352
1169c	Seq. ID No. 2357	Seq. ID No. 2358
1171c	Seq. ID No. 2363	Seq. ID No. 2364
1172	Seq. ID No. 2365	Seq. ID No. 2366
1173	Seq. ID No. 2367	Seq. ID No. 2368
1174	Seq. ID No. 2369	Seq. ID No. 2370
1175	Seq. ID No. 2371	Seq. ID No. 2372
1177	Seq. ID No. 2373	Seq. ID No. 2374
1178	Seq. ID No. 2375	Seq. ID No. 2376
1179b	Seq. ID No. 2379	Seq. ID No. 2380
1179c	Seq. ID No. 2381	Seq. ID No. 2382
1180b	Seq. ID No. 2385	Seq. ID No. 2386
1180c	Seq. ID No. 2387	Seq. ID No. 2388
1180e	Seq. ID No. 2391	Seq. ID No. 2392

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1182a	Seq. ID No. 2393	Seq. ID No. 2394
1182b	Seq. ID No. 2395	Seq. ID No. 2396
1183a	Seq. ID No. 2397	Seq. ID No. 2398
1183b	Seq. ID No. 2399	Seq. ID No. 2400
1184	Seq. ID No. 2401	Seq. ID No. 2402
1185b	Seq. ID No. 2405	Seq. ID No. 2406
1186b	Seq. ID No. 2409	Seq. ID No. 2410
1188b	Seq. ID No. 2413	Seq. ID No. 2414
1188c	Seq. ID No. 2415	Seq. ID No. 2416
1191	Seq. ID No. 2417	Seq. ID No. 2418
1192b	Seq. ID No. 2421	Seq. ID No. 2422
1194	Seq. ID No. 2423	Seq. ID No. 2424
1196a	Seq. ID No. 2425	Seq. ID No. 2426
1196b	Seq. ID No. 2427	Seq. ID No. 2428
1197	Seq. ID No. 2429	Seq. ID No. 2430
1199b	Seq. ID No. 2435	Seq. ID No. 2436
1200	Seq. ID No. 2437	Seq. ID No. 2438
1205	Seq. ID No. 2445	Seq. ID No. 2446
1206	Seq. ID No. 2447	Seq. ID No. 2448
1207	Seq. ID No. 2449	Seq. ID No. 2450
1208	Seq. ID No. 2451	Seq. ID No. 2452
1209	Seq. ID No. 2453	Seq. ID No. 2454
1210a	Seq. ID No. 2455	Seq. ID No. 2456
1210b	Seq. ID No. 2457	Seq. ID No. 2458
1212	Seq. ID No. 2459	Seq. ID No. 2460
1213a	Seq. ID No. 2461	Seq. ID No. 2462
1213b	Seq. ID No. 2463	Seq. ID No. 2464
1214	Seq. ID No. 2465	Seq. ID No. 2466
1215b	Seq. ID No. 2469	Seq. ID No. 2470

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1217c	Seq. ID No. 2471	Seq. ID No. 2472
1218b	Seq. ID No. 2475	Seq. ID No. 2476
1221a	Seq. ID No. 2481	Seq. ID No. 2482
1221b	Seq. ID No. 2483	Seq. ID No. 2484
1223	Seq. ID No. 2485	Seq. ID No. 2486
1224c	Seq. ID No. 2491	Seq. ID No. 2492
1225	Seq. ID No. 2493	Seq. ID No. 2494
1226	Seq. ID No. 2495	Seq. ID No. 2496
1228b	Seq. ID No. 2499	Seq. ID No. 2500
1229b	Seq. ID No. 2501	Seq. ID No. 2502
1229c	Seq. ID No. 2503	Seq. ID No. 2504
1230	Seq. ID No. 2505	Seq. ID No. 2506
1231	Seq. ID No. 2507	Seq. ID No. 2508
1233b	Seq. ID No. 2511	Seq. ID No. 2512
1233c	Seq. ID No. 2513	Seq. ID No. 2514
1234b	Seq. ID No. 2517	Seq. ID No. 2518
1234c	Seq. ID No. 2519	Seq. ID No. 2520
1235	Seq. ID No. 2521	Seq. ID No. 2522
1237	Seq. ID No. 2525	Seq. ID No. 2526
1240	Seq. ID No. 2529	Seq. ID No. 2530
1241b	Seq. ID No. 2533	Seq. ID No. 2534
1241c	Seq. ID No. 2535	Seq. ID No. 2536
1243	Seq. ID No. 2537	Seq. ID No. 2538
1244	Seq. ID No. 2539	Seq. ID No. 2540
1245d	Seq. ID No. 2547	Seq. ID No. 2548
1245e	Seq. ID No. 2549	Seq. ID No. 2550
1246a	Seq. ID No. 2551	Seq. ID No. 2552
1246b	Seq. ID No. 2553	Seq. ID No. 2554
1250c	Seq. ID No. 2559	Seq. ID No. 2560



TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1250d	Seq. ID No. 2561	Seq. ID No. 2562
1250e	Seq. ID No. 2563	Seq. ID No. 2564
1251a	Seq. ID No. 2565	Seq. ID No. 2566
1253c	Seq. ID No. 2573	Seq. ID No. 2574
1253d	Seq. ID No. 2575	Seq. ID No. 2576
1256	Seq. ID No. 2577	Seq. ID No. 2578
1257a	Seq. ID No. 2579	Seq. ID No. 2580
1257b	Seq. ID No. 2581	Seq. ID No. 2582
1258c	Seq. ID No. 2587	Seq. ID No. 2588
1258d	Seq. ID No. 2589	Seq. ID No. 2590
1260	Seq. ID No. 2591	Seq. ID No. 2592
1263	Seq. ID No. 2593	Seq. ID No. 2594
1265	Seq. ID No. 2595	Seq. ID No. 2596
1266b	Seq. ID No. 2599	Seq. ID No. 2600
1267b	Seq. ID No. 2603	Seq. ID No. 2604
1268a	Seq. ID No. 2605	Seq. ID No. 2606
1268b	Seq. ID No. 2607	Seq. ID No. 2608
1269	Seq. ID No. 2609	Seq. ID No. 2610
1270	Seq. ID No. 2611	Seq. ID No. 2612
1271	Seq. ID No. 2613	Seq. ID No. 2614
1272b	Seq. ID No. 2617	Seq. ID No. 2618
1273	Seq. ID No. 2619	Seq. ID No. 2620
1275b	Seq. ID No. 2623	Seq. ID No. 2624
1277	Seq. ID No. 2625	Seq. ID No. 2626
1278a	Seq. ID No. 2627	Seq. ID No. 2628
1278b	Seq. ID No. 2629	Seq. ID No. 2630
1279	Seq. ID No. 2631	Seq. ID No. 2632
1281	Seq. ID No. 2633	Seq. ID No. 2634
1283a	Seq. ID No. 2635	Seq. ID No. 2636

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1283b	Seq. ID No. 2637	Seq. ID No. 2638
1283c	Seq. ID No. 2639	Seq. ID No. 2640
1284	Seq. ID No. 2641	Seq. ID No. 2642
1285a	Seq. ID No. 2643	Seq. ID No. 2644
1285b	Seq. ID No. 2645	Seq. ID No. 2646
1287a	Seq. ID No. 2647	Seq. ID No. 2648
1287b	Seq. ID No. 2649	Seq. ID No. 2650
1288	Seq. ID No. 2651	Seq. ID No. 2652
1289	Seq. ID No. 2653	Seq. ID No. 2654
1290	Seq. ID No. 2655	Seq. ID No. 2656
1293b	Seq. ID No. 2659	Seq. ID No. 2660
1295	Seq. ID No. 2663	Seq. ID No. 2664
1297b	Seq. ID No. 2667	Seq. ID No. 2668
1300	Seq. ID No. 2669	Seq. ID No. 2670
1302	Seq. ID No. 2671	Seq. ID No. 2672
1305b	Seq. ID No. 2675	Seq. ID No. 2676
1305c	Seq. ID No. 2677	Seq. ID No. 2678
1308c	Seq. ID No. 2683	Seq. ID No. 2684
1308d	Seq. ID No. 2685	Seq. ID No. 2686
1308e	Seq. ID No. 2687	Seq. ID No. 2688
1311	Seq. ID No. 2689	Seq. ID No. 2690
1314b	Seq. ID No. 2691	Seq. ID No. 2692
1315	Seq. ID No. 2693	Seq. ID No. 2694
1316	Seq. ID No. 2695	Seq. ID No. 2696
1317	Seq. ID No. 2697	Seq. ID No. 2698
1318	Seq. ID No. 2699	Seq. ID No. 2700
1319b	Seq. ID No. 2703	Seq. ID No. 2704
1320c	Seq. ID No. 2709	Seq. ID No. 2710
1321	Seq. ID No. 2711	Seq. ID No. 2712

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1322b	Seq. ID No. 2715	Seq. ID No. 2716
1323b	Seq. ID No. 2717	Seq. ID No. 2718
1324	Seq. ID No. 2719	Seq. ID No. 2720
1326b	Seq. ID No. 2723	Seq. ID No. 2724
1326c	Seq. ID No. 2725	Seq. ID No. 2726
1333	Seq. ID No. 2727	Seq. ID No. 2728
1334a	Seq. ID No. 2729	Seq. ID No. 2730
1334b	Seq. ID No. 2731	Seq. ID No. 2732
1335b	Seq. ID No. 2735	Seq. ID No. 2736
1337	Seq. ID No. 2737	Seq. ID No. 2738
1338	Seq. ID No. 2739	Seq. ID No. 2740
1344a	Seq. ID No. 2749	Seq. ID No. 2750
1344b	Seq. ID No. 2751	Seq. ID No. 2752
1348	Seq. ID No. 2753	Seq. ID No. 2754
1349a	Seq. ID No. 2755	Seq. ID No. 2756
1349c	Seq. ID No. 2759	Seq. ID No. 2760
1353	Seq. ID No. 2765	Seq. ID No. 2766
1355	Seq. ID No. 2767	Seq. ID No. 2768
1358a	Seq. ID No. 2769	Seq. ID No. 2770
1358b	Seq. ID No. 2771	Seq. ID No. 2772
1359	Seq. ID No. 2773	Seq. ID No. 2774
1361	Seq. ID No. 2775	Seq. ID No. 2776
1364b	Seq. ID No. 2779	Seq. ID No. 2780
1364c	Seq. ID No. 2781	Seq. ID No. 2782
1365b	Seq. ID No. 2783	Seq. ID No. 2784
1366b	Seq. ID No. 2787	Seq. ID No. 2788
1367	Seq. ID No. 2789	Seq. ID No. 2790
1368	Seq. ID No. 2791	Seq. ID No. 2792
1371	Seq. ID No. 2793	Seq. ID No. 2794

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1373a	Seq. ID No. 2795	Seq. ID No. 2796
1373b	Seq. ID No. 2797	Seq. ID No. 2798
1374	Seq. ID No. 2799	Seq. ID No. 2800
1375	Seq. ID No. 2801	Seq. ID No. 2802
1377	Seq. ID No. 2803	Seq. ID No. 2804
1379	Seq. ID No. 2807	Seq. ID No. 2808
1380	Seq. ID No. 2809	Seq. ID No. 2810
1381b	Seq. ID No. 2813	Seq. ID No. 2814
1382	Seq. ID No. 2815	Seq. ID No. 2816
1384b	Seq. ID No. 2821	Seq. ID No. 2822
1384c	Seq. ID No. 2823	Seq. ID No. 2824
1386b	Seq. ID No. 2827	Seq. ID No. 2828
1387a	Seq. ID No. 2829	Seq. ID No. 2830
1388b	Seq. ID No. 2831	Seq. ID No. 2832
1389a	Seq. ID No. 2833	Seq. ID No. 2834
1393c	Seq. ID No. 2839	Seq. ID No. 2840
1393d	Seq. ID No. 2841	Seq. ID No. 2842
1394	Seq. ID No. 2843	Seq. ID No. 2844
1395a	Seq. ID No. 2845	Seq. ID No. 2846
1396	Seq. ID No. 2847	Seq. ID No. 2848
1399b	Seq. ID No. 2855	Seq. ID No. 2856
1402c	Seq. ID No. 2861	Seq. ID No. 2862
1405	Seq. ID No. 2863	Seq. ID No. 2864
1407b	Seq. ID No. 2865	Seq. ID No. 2866
1408	Seq. ID No. 2867	Seq. ID No. 2868
1409	Seq. ID No. 2869	Seq. ID No. 2870
1410	Seq. ID No. 2871	Seq. ID No. 2872
1411c	Seq. ID No. 2877	Seq. ID No. 2878
1412b	Seq. ID No. 2881	Seq. ID No. 2882

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1414a	Seq. ID No. 2883	Seq. ID No. 2884
1414b	Seq. ID No. 2885	Seq. ID No. 2886
1414c	Seq. ID No. 2887	Seq. ID No. 2888
1416	Seq. ID No. 2891	Seq. ID No. 2892
1418	Seq. ID No. 2893	Seq. ID No. 2894
1419	Seq. ID No. 2895	Seq. ID No. 2896
1420b	Seq. ID No. 2899	Seq. ID No. 2900
1422	Seq. ID No. 2901	Seq. ID No. 2902
1426b	Seq. ID No. 2907	Seq. ID No. 2908
1429a	Seq. ID No. 2915	Seq. ID No. 2916
1429b	Seq. ID No. 2917	Seq. ID No. 2918
1431	Seq. ID No. 2919	Seq. ID No. 2920
1432	Seq. ID No. 2921	Seq. ID No. 2922
1433	Seq. ID No. 2923	Seq. ID No. 2924
1434b	Seq. ID No. 2927	Seq. ID No. 2928
1437b	Seq. ID No. 2931	Seq. ID No. 2932
1437c	Seq. ID No. 2933	Seq. ID No. 2934
1438	Seq. ID No. 2935	Seq. ID No. 2936
1439d	Seq. ID No. 2943	Seq. ID No. 2944
1439e	Seq. ID No. 2945	Seq. ID No. 2946
1440c	Seq. ID No. 2951	Seq. ID No. 2952
1440d	Seq. ID No. 2953	Seq. ID No. 2954
1442b	Seq. ID No. 2957	Seq. ID No. 2958
1445a	Seq. ID No. 2959	Seq. ID No. 2960
1445b	Seq. ID No. 2961	Seq. ID No. 2962
1445c	Seq. ID No. 2963	Seq. ID No. 2964
1446a	Seq. ID No. 2965	Seq. ID No. 2966
1446b	Seq. ID No. 2967	Seq. ID No. 2968
1447b	Seq. ID No. 2971	Seq. ID No. 2972

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1448	Seq. ID No. 2973	Seq. ID No. 2974
1449a	Seq. ID No. 2975	Seq. ID No. 2976
1449b	Seq. ID No. 2977	Seq. ID No. 2978
1451	Seq. ID No. 2979	Seq. ID No. 2980
1452b	Seq. ID No. 2983	Seq. ID No. 2984
1453	Seq. ID No. 2985	Seq. ID No. 2986
1454	Seq. ID No. 2987	Seq. ID No. 2988
1455b	Seq. ID No. 2991	Seq. ID No. 2992
1456	Seq. ID No. 2993	Seq. ID No. 2994
1457c	Seq. ID No. 2999	Seq. ID No. 3000
1459	Seq. ID No. 3001	Seq. ID No. 3002
1462b	Seq. ID No. 3005	Seq. ID No. 3006
1463b	Seq. ID No. 3009	Seq. ID No. 3010
1463c	Seq. ID No. 3011	Seq. ID No. 3012
1466b	Seq. ID No. 3015	Seq. ID No. 3016
1466c	Seq. ID No. 3017	Seq. ID No. 3018
1466d	Seq. ID No. 3019	Seq. ID No. 3020
1467	Seq. ID No. 3021	Seq. ID No. 3022
1469c	Seq. ID No. 3027	Seq. ID No. 3028
1470c	Seq. ID No. 3033	Seq. ID No. 3034
1471	Seq. ID No. 3035	Seq. ID No. 3036
1472b	Seq. ID No. 3037	Seq. ID No. 3038
1472c	Seq. ID No. 3039	Seq. ID No. 3040
1475	Seq. ID No. 3043	Seq. ID No. 3044
1476	Seq. ID No. 3045	Seq. ID No. 3046
1477a	Seq. ID No. 3047	Seq. ID No. 3048
1477b	Seq. ID No. 3049	Seq. ID No. 3050
1479a	Seq. ID No. 3051	Seq. ID No. 3052
1479b	Seq. ID No. 3053	Seq. ID No. 3054

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1479c	Seq. ID No. 3055	Seq. ID No. 3056
1482a	Seq. ID No. 3057	Seq. ID No. 3058
1482b	Seq. ID No. 3059	Seq. ID No. 3060
1484c	Seq. ID No. 3067	Seq. ID No. 3068
1486	Seq. ID No. 3069	Seq. ID No. 3070
1487	Seq. ID No. 3071	Seq. ID No. 3072
1488d	Seq. ID No. 3079	Seq. ID No. 3080
1488f	Seq. ID No. 3083	Seq. ID No. 3084
1488g	Seq. ID No. 3085	Seq. ID No. 3086
1489	Seq. ID No. 3087	Seq. ID No. 3088
1494	Seq. ID No. 3091	Seq. ID No. 3092
1497	Seq. ID No. 3093	Seq. ID No. 3094
1498c	Seq. ID No. 3099	Seq. ID No. 3100
1498d	Seq. ID No. 3101	Seq. ID No. 3102
1499	Seq. ID No. 3103	Seq. ID No. 3104
1503a	Seq. ID No. 3109	Seq. ID No. 3110
1503b	Seq. ID No. 3111	Seq. ID No. 3112
1506b	Seq. ID No. 3115	Seq. ID No. 3116
1506c	Seq. ID No. 3117	Seq. ID No. 3118
1507a	Seq. ID No. 3119	Seq. ID No. 3120
1507b	Seq. ID No. 3121	Seq. ID No. 3122
1507c	Seq. ID No. 3123	Seq. ID No. 3124
1508	Seq. ID No. 3125	Seq. ID No. 3126
1510b	Seq. ID No. 3129	Seq. ID No. 3130
1510c	Seq. ID No. 3131	Seq. ID No. 3132
1510d	Seq. ID No. 3133	Seq. ID No. 3134
1511	Seq. ID No. 3135	Seq. ID No. 3136
1512	Seq. ID No. 3137	Seq. ID No. 3138
1513a	Seq. ID No. 3139	Seq. ID No. 3140

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1513b	Seq. ID No. 3141	Seq. ID No. 3142
1516	Seq. ID No. 3143	Seq. ID No. 3144
1517b	Seq. ID No. 3147	Seq. ID No. 3148
1517c	Seq. ID No. 3149	Seq. ID No. 3150
1518a	Seq. ID No. 3151	Seq. ID No. 3152
1518b	Seq. ID No. 3153	Seq. ID No. 3154
1520	Seq. ID No. 3155	Seq. ID No. 3156
1522	Seq. ID No. 3157	Seq. ID No. 3158
1523	Seq. ID No. 3159	Seq. ID No. 3160
1528	Seq. ID No. 3161	Seq. ID No. 3162
1530b	Seq. ID No. 3165	Seq. ID No. 3166
1533a	Seq. ID No. 3167	Seq. ID No. 3168
1534a	Seq. ID No. 3169	Seq. ID No. 3170
1534b	Seq. ID No. 3171	Seq. ID No. 3172
1535a	Seq. ID No. 3173	Seq. ID No. 3174
1537	Seq. ID No. 3179	Seq. ID No. 3180
1542	Seq. ID No. 3181	Seq. ID No. 3182
1543	Seq. ID No. 3183	Seq. ID No. 3184
1544	Seq. ID No. 3185	Seq. ID No. 3186
1547a	Seq. ID No. 3187	Seq. ID No. 3188
1547b	Seq. ID No. 3189	Seq. ID No. 3190
1548	Seq. ID No. 3191	Seq. ID No. 3192
1552	Seq. ID No. 3193	Seq. ID No. 3194
1553a	Seq. ID No. 3195	Seq. ID No. 3196
1553b	Seq. ID No. 3197	Seq. ID No. 3198
1554c	Seq. ID No. 3203	Seq. ID No. 3204
1555	Seq. ID No. 3205	Seq. ID No. 3206
1556a	Seq. ID No. 3207	Seq. ID No. 3208
1556b	Seq. ID No. 3209	Seq. ID No. 3210



TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1556c	Seq. ID No. 3211	Seq. ID No. 3212
1557c	Seq. ID No. 3217	Seq. ID No. 3218
1563	Seq. ID No. 3223	Seq. ID No. 3224
1564a	Seq. ID No. 3225	Seq. ID No. 3226
1564b	Seq. ID No. 3227	Seq. ID No. 3228
1565	Seq. ID No. 3229	Seq. ID No. 3230
1569	Seq. ID No. 3235	Seq. ID No. 3236
1572e	Seq. ID No. 3249	Seq. ID No. 3250
1573	Seq. ID No. 3251	Seq. ID No. 3252
1576	Seq. ID No. 3253	Seq. ID No. 3254
1577a	Seq. ID No. 3255	Seq. ID No. 3256
1577b	Seq. ID No. 3257	Seq. ID No. 3258
1578	Seq. ID No. 3259	Seq. ID No. 3260
1580b	Seq. ID No. 3263	Seq. ID No. 3264
1581	Seq. ID No. 3265	Seq. ID No. 3266
1582b	Seq. ID No. 3269	Seq. ID No. 3270
1582c	Seq. ID No. 3271	Seq. ID No. 3272
1584	Seq. ID No. 3273	Seq. ID No. 3274
1585b	Seq. ID No. 3277	Seq. ID No. 3278
1587b	Seq. ID No. 3281	Seq. ID No. 3282
1587c	Seq. ID No. 3283	Seq. ID No. 3284
1588	Seq. ID No. 3285	Seq. ID No. 3286
1591	Seq. ID No. 3289	Seq. ID No. 3290
1592a	Seq. ID No. 3291	Seq. ID No. 3292
1592b	Seq. ID No. 3293	Seq. ID No. 3294
1594b	Seq. ID No. 3299	Seq. ID No. 3300
1595a	Seq. ID No. 3301	Seq. ID No. 3302
1595b	Seq. ID No. 3303	Seq. ID No. 3304
1598a	Seq. ID No. 3305	Seq. ID No. 3306

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1598b	Seq. ID No. 3307	Seq. ID No. 3308
1600a	Seq. ID No. 3309	Seq. ID No. 3310
1600b	Seq. ID No. 3311	Seq. ID No. 3312
1600c	Seq. ID No. 3313	Seq. ID No. 3314
1602	Seq. ID No. 3315	Seq. ID No. 3316
1606b	Seq. ID No. 3319	Seq. ID No. 3320
1607a	Seq. ID No. 3321	Seq. ID No. 3322
1607b	Seq. ID No. 3323	Seq. ID No. 3324
1608	Seq. ID No. 3325	Seq. ID No. 3326
1612	Seq. ID No. 3331	Seq. ID No. 3332
1616b	Seq. ID No. 3335	Seq. ID No. 3336
1619	Seq. ID No. 3337	Seq. ID No. 3338
1621	Seq. ID No. 3339	Seq. ID No. 3340
1622a	Seq. ID No. 3341	Seq. ID No. 3342
1623b	Seq. ID No. 3345	Seq. ID No. 3346
1623c	Seq. ID No. 3347	Seq. ID No. 3348
1624	Seq. ID No. 3349	Seq. ID No. 3350
1625b	Seq. ID No. 3353	Seq. ID No. 3354
1625c	Seq. ID No. 3355	Seq. ID No. 3356
1626b	Seq. ID No. 3359	Seq. ID No. 3360
1628a	Seq. ID No. 3361	Seq. ID No. 3362
1628b	Seq. ID No. 3363	Seq. ID No. 3364
1632a	Seq. ID No. 3365	Seq. ID No. 3366
1632b	Seq. ID No. 3367	Seq. ID No. 3368
1633a	Seq. ID No. 3369	Seq. ID No. 3370
1633b	Seq. ID No. 3371	Seq. ID No. 3372
1634a	Seq. ID No. 3373	Seq. ID No. 3374
1634b	Seq. ID No. 3375	Seq. ID No. 3376
1634c	Seq. ID No. 3377	Seq. ID No. 3378

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1639b	Seq. ID No. 3379	Seq. ID No. 3380
1642a	Seq. ID No. 3381	Seq. ID No. 3382
1642b	Seq. ID No. 3383	Seq. ID No. 3384
1646e	Seq. ID No. 3397	Seq. ID No. 3398
1646f	Seq. ID No. 3399	Seq. ID No. 3400
1647	Seq. ID No. 3401	Seq. ID No. 3402
1649b	Seq. ID No. 3407	Seq. ID No. 3408
1649c	Seq. ID No. 3409	Seq. ID No. 3410
1652b	Seq. ID No. 3413	Seq. ID No. 3414
1654	Seq. ID No. 3415	Seq. ID No. 3416
1657	Seq. ID No. 3419	Seq. ID No. 3420
1659c	Seq. ID No. 3425	Seq. ID No. 3426
1660b	Seq. ID No. 3427	Seq. ID No. 3428
1662b	Seq. ID No. 3431	Seq. ID No. 3432
1663	Seq. ID No. 3433	Seq. ID No. 3434
1664	Seq. ID No. 3435	Seq. ID No. 3436
1668	Seq. ID No. 3439	Seq. ID No. 3440
1669	Seq. ID No. 3441	Seq. ID No. 3442
1670a	Seq. ID No. 3443	Seq. ID No. 3444
1670b	Seq. ID No. 3445	Seq. ID No. 3446
1670c	Seq. ID No. 3447	Seq. ID No. 3448
1673d	Seq. ID No. 3455	Seq. ID No. 3456
1673e	Seq. ID No. 3457	Seq. ID No. 3458
1673f	Seq. ID No. 3459	Seq. ID No. 3460
1674	Seq. ID No. 3461	Seq. ID No. 3462
1675b	Seq. ID No. 3465	Seq. ID No. 3466
1675c	Seq. ID No. 3467	Seq. ID No. 3468
1677	Seq. ID No. 3471	Seq. ID No. 3472
1679	Seq. ID No. 3473	Seq. ID No. 3474

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1680	Seq. ID No. 3475	Seq. ID No. 3476
1682b	Seq. ID No. 3479	Seq. ID No. 3480
1683b	Seq. ID No. 3483	Seq. ID No. 3484
1684	Seq. ID No. 3485	Seq. ID No. 3486
1685	Seq. ID No. 3487	Seq. ID No. 3488
1687	Seq. ID No. 3489	Seq. ID No. 3490
1688c	Seq. ID No. 3495	Seq. ID No. 3496
1689a	Seq. ID No. 3497	Seq. ID No. 3498
1689b	Seq. ID No. 3499	Seq. ID No. 3500
1689c	Seq. ID No. 3501	Seq. ID No. 3502
1690b	Seq. ID No. 3505	Seq. ID No. 3506
1691	Seq. ID No. 3507	Seq. ID No. 3508
1692	Seq. ID No. 3509	Seq. ID No. 3510
1693	Seq. ID No. 3511	Seq. ID No. 3512
1694a	Seq. ID No. 3513	Seq. ID No. 3514
1694c	Seq. ID No. 3517	Seq. ID No. 3518
1694d	Seq. ID No. 3519	Seq. ID No. 3520
1696	Seq. ID No. 3521	Seq. ID No. 3522
1697b	Seq. ID No. 3525	Seq. ID No. 3526
1699b	Seq. ID No. 3529	Seq. ID No. 3530
1700a	Seq. ID No. 3531	Seq. ID No. 3532
1700b	Seq. ID No. 3533	Seq. ID No. 3534
1701a	Seq. ID No. 3535	Seq. ID No. 3536
1701b	Seq. ID No. 3537	Seq. ID No. 3538
1703b	Seq. ID No. 3539	Seq. ID No. 3540
1704a	Seq. ID No. 3541	Seq. ID No. 3542
1704b	Seq. ID No. 3543	Seq. ID No. 3544
1705a	Seq. ID No. 3545	Seq. ID No. 3546
1705b	Seq. ID No. 3547	Seq. ID No. 3548

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1706	Seq. ID No. 3549	Seq. ID No. 3550
1707a	Seq. ID No. 3551	Seq. ID No. 3552
1707b	Seq. ID No. 3553	Seq. ID No. 3554
1708	Seq. ID No. 3555	Seq. ID No. 3556
1709	Seq. ID No. 3557	Seq. ID No. 3558
1710a	Seq. ID No. 3559	Seq. ID No. 3560
1710b	Seq. ID No. 3561	Seq. ID No. 3562
1712a	Seq. ID No. 3563	Seq. ID No. 3564
1712b	Seq. ID No. 3565	Seq. ID No. 3566
1715a	Seq. ID No. 3567	Seq. ID No. 3568
1715b	Seq. ID No. 3569	Seq. ID No. 3570
1718a	Seq. ID No. 3571	Seq. ID No. 3572
1718b	Seq. ID No. 3573	Seq. ID No. 3574
1722	Seq. ID No. 3575	Seq. ID No. 3576
1723b	Seq. ID No. 3579	Seq. ID No. 3580
1724	Seq. ID No. 3581	Seq. ID No. 3582
1727	Seq. ID No. 3583	Seq. ID No. 3584
1731	Seq. ID No. 3587	Seq. ID No. 3588
1733	Seq. ID No. 3589	Seq. ID No. 3590
1735b	Seq. ID No. 3595	Seq. ID No. 3596
1737a	Seq. ID No. 3597	Seq. ID No. 3598
1737b	Seq. ID No. 3599	Seq. ID No. 3600
1738b	Seq. ID No. 3603	Seq. ID No. 3604
1738c	Seq. ID No. 3605	Seq. ID No. 3606
1739	Seq. ID No. 3607	Seq. ID No. 3608
1741	Seq. ID No. 3609	Seq. ID No. 3610
1743	Seq. ID No. 3611	Seq. ID No. 3612
1744a	Seq. ID No. 3613	Seq. ID No. 3614
1744b	Seq. ID No. 3615	Seq. ID No. 3616

**TABLE 20: WYETH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1745	Seq. ID No. 3617	Seq. ID No. 3618
1747	Seq. ID No. 3619	Seq. ID No. 3620
1749a	Seq. ID No. 3621	Seq. ID No. 3622
1749b	Seq. ID No. 3623	Seq. ID No. 3624
1752a	Seq. ID No. 3627	Seq. ID No. 3628
1752b	Seq. ID No. 3629	Seq. ID No. 3630
1756b	Seq. ID No. 3635	Seq. ID No. 3636
1757a	Seq. ID No. 3637	Seq. ID No. 3638
1757b	Seq. ID No. 3639	Seq. ID No. 3640
1759	Seq. ID No. 3641	Seq. ID No. 3642
1762	Seq. ID No. 3645	Seq. ID No. 3646
1764a	Seq. ID No. 3647	Seq. ID No. 3648
1764b	Seq. ID No. 3649	Seq. ID No. 3650
1764c	Seq. ID No. 3651	Seq. ID No. 3652
1765	Seq. ID No. 3653	Seq. ID No. 3654
1767a	Seq. ID No. 3657	Seq. ID No. 3658
1767b	Seq. ID No. 3659	Seq. ID No. 3660
1769b	Seq. ID No. 3663	Seq. ID No. 3664
1771	Seq. ID No. 3665	Seq. ID No. 3666
1773	Seq. ID No. 3667	Seq. ID No. 3668
1775a	Seq. ID No. 3671	Seq. ID No. 3672
1775b	Seq. ID No. 3673	Seq. ID No. 3674
1775c	Seq. ID No. 3675	Seq. ID No. 3676
1778a	Seq. ID No. 3677	Seq. ID No. 3678
1778b	Seq. ID No. 3679	Seq. ID No. 3680
1780	Seq. ID No. 3681	Seq. ID No. 3682
1783a	Seq. ID No. 3683	Seq. ID No. 3684
1783b	Seq. ID No. 3685	Seq. ID No. 3686
1784a	Seq. ID No. 3687	Seq. ID No. 3688

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1784b	Seq. ID No. 3689	Seq. ID No. 3690
1788a	Seq. ID No. 3691	Seq. ID No. 3692
1788b	Seq. ID No. 3693	Seq. ID No. 3694
1788c	Seq. ID No. 3695	Seq. ID No. 3696
1789b	Seq. ID No. 3699	Seq. ID No. 3700
1790a	Seq. ID No. 3701	Seq. ID No. 3702
1790b	Seq. ID No. 3703	Seq. ID No. 3704
1792a	Seq. ID No. 3705	Seq. ID No. 3706
1792b	Seq. ID No. 3707	Seq. ID No. 3708
1792c	Seq. ID No. 3709	Seq. ID No. 3710
1793b	Seq. ID No. 3713	Seq. ID No. 3714
1793c	Seq. ID No. 3715	Seq. ID No. 3716
1794a	Seq. ID No. 3717	Seq. ID No. 3718
1798c	Seq. ID No. 3727	Seq. ID No. 3728
1800	Seq. ID No. 3729	Seq. ID No. 3730
1802b	Seq. ID No. 3733	Seq. ID No. 3734
1804a	Seq. ID No. 3737	Seq. ID No. 3738
1804b	Seq. ID No. 3739	Seq. ID No. 3740
1805	Seq. ID No. 3741	Seq. ID No. 3742
1806b	Seq. ID No. 3745	Seq. ID No. 3746
1806c	Seq. ID No. 3747	Seq. ID No. 3748
1808d	Seq. ID No. 3759	Seq. ID No. 3760
1809d	Seq. ID No. 3767	Seq. ID No. 3768
1809e	Seq. ID No. 3769	Seq. ID No. 3770
1809f	Seq. ID No. 3771	Seq. ID No. 3772
1811b	Seq. ID No. 3779	Seq. ID No. 3780
1812b	Seq. ID No. 3783	Seq. ID No. 3784
1813	Seq. ID No. 3785	Seq. ID No. 3786
1815b	Seq. ID No. 3789	Seq. ID No. 3790

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1815c	Seq. ID No. 3791	Seq. ID No. 3792
1816b	Seq. ID No. 3795	Seq. ID No. 3796
1816c	Seq. ID No. 3797	Seq. ID No. 3798
1819b	Seq. ID No. 3803	Seq. ID No. 3804
1821	Seq. ID No. 3805	Seq. ID No. 3806
1822	Seq. ID No. 3807	Seq. ID No. 3808
1823a	Seq. ID No. 3809	Seq. ID No. 3810
1823b	Seq. ID No. 3811	Seq. ID No. 3812
1825	Seq. ID No. 3813	Seq. ID No. 3814
1826a	Seq. ID No. 3815	Seq. ID No. 3816
1826b	Seq. ID No. 3817	Seq. ID No. 3818
1828	Seq. ID No. 3819	Seq. ID No. 3820
1830b	Seq. ID No. 3823	Seq. ID No. 3824
1833	Seq. ID No. 3825	Seq. ID No. 3826
1836a	Seq. ID No. 3831	Seq. ID No. 3832
1836b	Seq. ID No. 3833	Seq. ID No. 3834
1837	Seq. ID No. 3835	Seq. ID No. 3836
1838c	Seq. ID No. 3841	Seq. ID No. 3842
1838d	Seq. ID No. 3843	Seq. ID No. 3844
1839b	Seq. ID No. 3847	Seq. ID No. 3848
1842d	Seq. ID No. 3855	Seq. ID No. 3856
1843	Seq. ID No. 3857	Seq. ID No. 3858
1845c	Seq. ID No. 3863	Seq. ID No. 3864
1848b	Seq. ID No. 3867	Seq. ID No. 3868
1850b	Seq. ID No. 3871	Seq. ID No. 3872
1850c	Seq. ID No. 3873	Seq. ID No. 3874
1853a	Seq. ID No. 3875	Seq. ID No. 3876
1853b	Seq. ID No. 3877	Seq. ID No. 3878
1854b	Seq. ID No. 3881	Seq. ID No. 3882



TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1855	Seq. ID No. 3883	Seq. ID No. 3884
1856	Seq. ID No. 3885	Seq. ID No. 3886
1857d	Seq. ID No. 3893	Seq. ID No. 3894
1858	Seq. ID No. 3895	Seq. ID No. 3896
1861a	Seq. ID No. 3899	Seq. ID No. 3900
1861b	Seq. ID No. 3901	Seq. ID No. 3902
1863a	Seq. ID No. 3905	Seq. ID No. 3906
1863b	Seq. ID No. 3907	Seq. ID No. 3908
1865a	Seq. ID No. 3911	Seq. ID No. 3912
1865b	Seq. ID No. 3913	Seq. ID No. 3914
1868	Seq. ID No. 3915	Seq. ID No. 3916
1870	Seq. ID No. 3919	Seq. ID No. 3920
1873a	Seq. ID No. 3921	Seq. ID No. 3922
1873b	Seq. ID No. 3923	Seq. ID No. 3924
1873c	Seq. ID No. 3925	Seq. ID No. 3926
1875b	Seq. ID No. 3927	Seq. ID No. 3928
1875c	Seq. ID No. 3929	Seq. ID No. 3930
1877a	Seq. ID No. 3931	Seq. ID No. 3932
1877b	Seq. ID No. 3933	Seq. ID No. 3934
1878	Seq. ID No. 3935	Seq. ID No. 3936
1882	Seq. ID No. 3939	Seq. ID No. 3940
1884	Seq. ID No. 3941	Seq. ID No. 3942
1886	Seq. ID No. 3943	Seq. ID No. 3944
1887	Seq. ID No. 3945	Seq. ID No. 3946
1888a	Seq. ID No. 3947	Seq. ID No. 3948
1888b	Seq. ID No. 3949	Seq. ID No. 3950
1890	Seq. ID No. 3951	Seq. ID No. 3952
1891a	Seq. ID No. 3953	Seq. ID No. 3954
1891b	Seq. ID No. 3955	Seq. ID No. 3956

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1893	Seq. ID No. 3957	Seq. ID No. 3958
1894c	Seq. ID No. 3959	Seq. ID No. 3960
1895	Seq. ID No. 3961	Seq. ID No. 3962
1896b	Seq. ID No. 3965	Seq. ID No. 3966
1897a	Seq. ID No. 3967	Seq. ID No. 3968
1897b	Seq. ID No. 3969	Seq. ID No. 3970
1897c	Seq. ID No. 3971	Seq. ID No. 3972
1898b	Seq. ID No. 3975	Seq. ID No. 3976
1900	Seq. ID No. 3979	Seq. ID No. 3980
1902a	Seq. ID No. 3981	Seq. ID No. 3982
1902b	Seq. ID No. 3983	Seq. ID No. 3984
1907	Seq. ID No. 3985	Seq. ID No. 3986
1912	Seq. ID No. 3987	Seq. ID No. 3988
1915b	Seq. ID No. 3991	Seq. ID No. 3992
1917a	Seq. ID No. 3995	Seq. ID No. 3996
1917b	Seq. ID No. 3997	Seq. ID No. 3998
1918b	Seq. ID No. 3999	Seq. ID No. 4000
1918d	Seq. ID No. 4003	Seq. ID No. 4004
1919b	Seq. ID No. 4007	Seq. ID No. 4008
1919c	Seq. ID No. 4009	Seq. ID No. 4010
1925	Seq. ID No. 4015	Seq. ID No. 4016
1926	Seq. ID No. 4017	Seq. ID No. 4018
1927b	Seq. ID No. 4021	Seq. ID No. 4022
1930	Seq. ID No. 4023	Seq. ID No. 4024
1931c	Seq. ID No. 4029	Seq. ID No. 4030
1933b	Seq. ID No. 4035	Seq. ID No. 4036
1934	Seq. ID No. 4037	Seq. ID No. 4038
1936	Seq. ID No. 4039	Seq. ID No. 4040
1937e	Seq. ID No. 4049	Seq. ID No. 4050

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1939a	Seq. ID No. 4051	Seq. ID No. 4052
1939b	Seq. ID No. 4053	Seq. ID No. 4054
1939c	Seq. ID No. 4055	Seq. ID No. 4056
1940	Seq. ID No. 4057	Seq. ID No. 4058
1941b	Seq. ID No. 4061	Seq. ID No. 4062
1946c	Seq. ID No. 4075	Seq. ID No. 4076
1950	Seq. ID No. 4079	Seq. ID No. 4080
1951c	Seq. ID No. 4085	Seq. ID No. 4086
1951d	Seq. ID No. 4087	Seq. ID No. 4088
1953	Seq. ID No. 4089	Seq. ID No. 4090
1954a	Seq. ID No. 4091	Seq. ID No. 4092
1954b	Seq. ID No. 4093	Seq. ID No. 4094
1954c	Seq. ID No. 4095	Seq. ID No. 4096
1957	Seq. ID No. 4099	Seq. ID No. 4100
1958c	Seq. ID No. 4105	Seq. ID No. 4106
1960a	Seq. ID No. 4107	Seq. ID No. 4108
1960b	Seq. ID No. 4109	Seq. ID No. 4110
1960c	Seq. ID No. 4111	Seq. ID No. 4112
1961	Seq. ID No. 4113	Seq. ID No. 4114
1962b	Seq. ID No. 4117	Seq. ID No. 4118
1965a	Seq. ID No. 4119	Seq. ID No. 4120
1965b	Seq. ID No. 4121	Seq. ID No. 4122
1966	Seq. ID No. 4123	Seq. ID No. 4124
1967	Seq. ID No. 4125	Seq. ID No. 4126
1968	Seq. ID No. 4127	Seq. ID No. 4128
1969	Seq. ID No. 4129	Seq. ID No. 4130
1970a	Seq. ID No. 4131	Seq. ID No. 4132
1970b	Seq. ID No. 4133	Seq. ID No. 4134
1972	Seq. ID No. 4135	Seq. ID No. 4136

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1973	Seq. ID No. 4137	Seq. ID No. 4138
1976	Seq. ID No. 4139	Seq. ID No. 4140
1977a	Seq. ID No. 4141	Seq. ID No. 4142
1977b	Seq. ID No. 4143	Seq. ID No. 4144
1977c	Seq. ID No. 4145	Seq. ID No. 4146
1979b	Seq. ID No. 4149	Seq. ID No. 4150
1980b	Seq. ID No. 4153	Seq. ID No. 4154
1981	Seq. ID No. 4155	Seq. ID No. 4156
1982	Seq. ID No. 4157	Seq. ID No. 4158
1985b	Seq. ID No. 4161	Seq. ID No. 4162
1986	Seq. ID No. 4163	Seq. ID No. 4164
1987b	Seq. ID No. 4167	Seq. ID No. 4168
1989b	Seq. ID No. 4171	Seq. ID No. 4172
1989c	Seq. ID No. 4173	Seq. ID No. 4174
1990a	Seq. ID No. 4175	Seq. ID No. 4176
1990b	Seq. ID No. 4177	Seq. ID No. 4178
1990c	Seq. ID No. 4179	Seq. ID No. 4180
1991	Seq. ID No. 4181	Seq. ID No. 4182
1992b	Seq. ID No. 4185	Seq. ID No. 4186
1993a	Seq. ID No. 4187	Seq. ID No. 4188
1993b	Seq. ID No. 4189	Seq. ID No. 4190
1993c	Seq. ID No. 4191	Seq. ID No. 4192
1996	Seq. ID No. 4193	Seq. ID No. 4194
2000	Seq. ID No. 4195	Seq. ID No. 4196
2001	Seq. ID No. 4197	Seq. ID No. 4198
2003	Seq. ID No. 4199	Seq. ID No. 4200
2008	Seq. ID No. 4203	Seq. ID No. 4204
2010	Seq. ID No. 4205	Seq. ID No. 4206
2011a	Seq. ID No. 4207	Seq. ID No. 4208

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2011b	Seq. ID No. 4209	Seq. ID No. 4210
2011c	Seq. ID No. 4211	Seq. ID No. 4212
2015	Seq. ID No. 4219	Seq. ID No. 4220
2016e	Seq. ID No. 4229	Seq. ID No. 4230
2016g	Seq. ID No. 4233	Seq. ID No. 4234
2016h	Seq. ID No. 4235	Seq. ID No. 4236
2020	Seq. ID No. 4237	Seq. ID No. 4238
2021	Seq. ID No. 4239	Seq. ID No. 4240
2023b	Seq. ID No. 4243	Seq. ID No. 4244
2024c	Seq. ID No. 4249	Seq. ID No. 4250
2024d	Seq. ID No. 4251	Seq. ID No. 4252
2025	Seq. ID No. 4253	Seq. ID No. 4254
2027	Seq. ID No. 4255	Seq. ID No. 4256
2030b	Seq. ID No. 4259	Seq. ID No. 4260
2030d	Seq. ID No. 4263	Seq. ID No. 4264
2032c	Seq. ID No. 4265	Seq. ID No. 4266
2033	Seq. ID No. 4267	Seq. ID No. 4268
2035b	Seq. ID No. 4269	Seq. ID No. 4270
2036	Seq. ID No. 4271	Seq. ID No. 4272
2037	Seq. ID No. 4273	Seq. ID No. 4274
2038a	Seq. ID No. 4275	Seq. ID No. 4276
2043b	Seq. ID No. 4281	Seq. ID No. 4282
2044	Seq. ID No. 4283	Seq. ID No. 4284
2045a	Seq. ID No. 4285	Seq. ID No. 4286
2045b	Seq. ID No. 4287	Seq. ID No. 4288
2046a	Seq. ID No. 4289	Seq. ID No. 4290
2046b	Seq. ID No. 4291	Seq. ID No. 4292
2047a	Seq. ID No. 4293	Seq. ID No. 4294
2047b	Seq. ID No. 4295	Seq. ID No. 4296

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2049c	Seq. ID No. 4297	Seq. ID No. 4298
2050	Seq. ID No. 4299	Seq. ID No. 4300
2053	Seq. ID No. 4301	Seq. ID No. 4302
2054	Seq. ID No. 4303	Seq. ID No. 4304
2056	Seq. ID No. 4307	Seq. ID No. 4308
2057	Seq. ID No. 4309	Seq. ID No. 4310
2059b	Seq. ID No. 4313	Seq. ID No. 4314
2060a	Seq. ID No. 4315	Seq. ID No. 4316
2060b	Seq. ID No. 4317	Seq. ID No. 4318
2062a	Seq. ID No. 4319	Seq. ID No. 4320
2062b	Seq. ID No. 4321	Seq. ID No. 4322
2062c	Seq. ID No. 4323	Seq. ID No. 4324
2064	Seq. ID No. 4325	Seq. ID No. 4326
2065b	Seq. ID No. 4329	Seq. ID No. 4330
2066	Seq. ID No. 4331	Seq. ID No. 4332
2068	Seq. ID No. 4333	Seq. ID No. 4334
2069a	Seq. ID No. 4335	Seq. ID No. 4336
2069b	Seq. ID No. 4337	Seq. ID No. 4338
2069c	Seq. ID No. 4339	Seq. ID No. 4340
2074b	Seq. ID No. 4343	Seq. ID No. 4344
2075a	Seq. ID No. 4345	Seq. ID No. 4346
2075b	Seq. ID No. 4347	Seq. ID No. 4348
2076b	Seq. ID No. 4351	Seq. ID No. 4352
2076c	Seq. ID No. 4353	Seq. ID No. 4354
2078	Seq. ID No. 4355	Seq. ID No. 4356
2079b	Seq. ID No. 4359	Seq. ID No. 4360
2079c	Seq. ID No. 4361	Seq. ID No. 4362
2081a	Seq. ID No. 4363	Seq. ID No. 4364
2081b	Seq. ID No. 4365	Seq. ID No. 4366

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2086a	Seq. ID No. 4367	Seq. ID No. 4368
2086b	Seq. ID No. 4369	Seq. ID No. 4370
2088	Seq. ID No. 4375	Seq. ID No. 4376
2091	Seq. ID No. 4377	Seq. ID No. 4378
2092	Seq. ID No. 4379	Seq. ID No. 4380
2094	Seq. ID No. 4383	Seq. ID No. 4384
2096c	Seq. ID No. 4389	Seq. ID No. 4390
2096d	Seq. ID No. 4391	Seq. ID No. 4392
2097	Seq. ID No. 4393	Seq. ID No. 4394
2098b	Seq. ID No. 4395	Seq. ID No. 4396
2100	Seq. ID No. 4397	Seq. ID No. 4398
2101	Seq. ID No. 4399	Seq. ID No. 4400
2104	Seq. ID No. 4401	Seq. ID No. 4402
2105	Seq. ID No. 4403	Seq. ID No. 4404
2107a	Seq. ID No. 4405	Seq. ID No. 4406
2107b	Seq. ID No. 4407	Seq. ID No. 4408
2109a	Seq. ID No. 4409	Seq. ID No. 4410
2109b	Seq. ID No. 4411	Seq. ID No. 4412
2110a	Seq. ID No. 4413	Seq. ID No. 4414
2110b	Seq. ID No. 4415	Seq. ID No. 4416
2110c	Seq. ID No. 4417	Seq. ID No. 4418
2112a	Seq. ID No. 4419	Seq. ID No. 4420
2112b	Seq. ID No. 4421	Seq. ID No. 4422
2112c	Seq. ID No. 4423	Seq. ID No. 4424
2114b	Seq. ID No. 4425	Seq. ID No. 4426
2115a	Seq. ID No. 4427	Seq. ID No. 4428
2115b	Seq. ID No. 4429	Seq. ID No. 4430
2115c	Seq. ID No. 4431	Seq. ID No. 4432
2117	Seq. ID No. 4435	Seq. ID No. 4436

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2120a	Seq. ID No. 4437	Seq. ID No. 4438
2120b	Seq. ID No. 4439	Seq. ID No. 4440
2122b	Seq. ID No. 4441	Seq. ID No. 4442
2125a	Seq. ID No. 4449	Seq. ID No. 4450
2125b	Seq. ID No. 4451	Seq. ID No. 4452
2127a	Seq. ID No. 4453	Seq. ID No. 4454
2127b	Seq. ID No. 4455	Seq. ID No. 4456
2128a	Seq. ID No. 4457	Seq. ID No. 4458
2128b	Seq. ID No. 4459	Seq. ID No. 4460
2129a	#N/A	#N/A
2129b	#N/A	#N/A
2133	Seq. ID No. 4461	Seq. ID No. 4462
2138b	Seq. ID No. 4465	Seq. ID No. 4466
2138c	Seq. ID No. 4467	Seq. ID No. 4468
2140b	Seq. ID No. 4471	Seq. ID No. 4472
2142b	Seq. ID No. 4475	Seq. ID No. 4476
2144a	Seq. ID No. 4477	Seq. ID No. 4478
2144b	Seq. ID No. 4479	Seq. ID No. 4480
2146	Seq. ID No. 4481	Seq. ID No. 4482
2147b	Seq. ID No. 4485	Seq. ID No. 4486
2147c	Seq. ID No. 4487	Seq. ID No. 4488
2149a	Seq. ID No. 4489	Seq. ID No. 4490
2149b	Seq. ID No. 4491	Seq. ID No. 4492
2150a	Seq. ID No. 4493	Seq. ID No. 4494
2150b	Seq. ID No. 4495	Seq. ID No. 4496
2150c	Seq. ID No. 4497	Seq. ID No. 4498
2153	Seq. ID No. 4501	Seq. ID No. 4502
2155a	Seq. ID No. 4503	Seq. ID No. 4504
2155b	Seq. ID No. 4505	Seq. ID No. 4506



TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2156a	Seq. ID No. 4507	Seq. ID No. 4508
2156b	Seq. ID No. 4509	Seq. ID No. 4510
2156c	Seq. ID No. 4511	Seq. ID No. 4512
2159a	Seq. ID No. 4513	Seq. ID No. 4514
2159b	Seq. ID No. 4515	Seq. ID No. 4516
2160b	Seq. ID No. 4519	Seq. ID No. 4520
2160c	Seq. ID No. 4521	Seq. ID No. 4522
2160d	Seq. ID No. 4523	Seq. ID No. 4524
2161a	Seq. ID No. 4525	Seq. ID No. 4526
2161b	Seq. ID No. 4527	Seq. ID No. 4528
2161c	Seq. ID No. 4529	Seq. ID No. 4530
2164	Seq. ID No. 4531	Seq. ID No. 4532
2165	Seq. ID No. 4533	Seq. ID No. 4534
2166b	Seq. ID No. 4537	Seq. ID No. 4538
2171	Seq. ID No. 4541	Seq. ID No. 4542
2173a	Seq. ID No. 4545	Seq. ID No. 4546
2173b	Seq. ID No. 4547	Seq. ID No. 4548
2174	Seq. ID No. 4549	Seq. ID No. 4550
2175	Seq. ID No. 4551	Seq. ID No. 4552
2176a	Seq. ID No. 4553	Seq. ID No. 4554
2176b	Seq. ID No. 4555	Seq. ID No. 4556
2176d	Seq. ID No. 4559	Seq. ID No. 4560
2177b	Seq. ID No. 4561	Seq. ID No. 4562
2179b	Seq. ID No. 4565	Seq. ID No. 4566
2180	Seq. ID No. 4567	Seq. ID No. 4568
2181b	Seq. ID No. 4571	Seq. ID No. 4572
2182	Seq. ID No. 4573	Seq. ID No. 4574
2183	Seq. ID No. 4575	Seq. ID No. 4576
2185	Seq. ID No. 4577	Seq. ID No. 4578

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2186b	Seq. ID No. 4581	Seq. ID No. 4582
2189b	Seq. ID No. 4585	Seq. ID No. 4586
2190b	Seq. ID No. 4589	Seq. ID No. 4590
2193	Seq. ID No. 4591	Seq. ID No. 4592
2196	Seq. ID No. 4597	Seq. ID No. 4598
2197a	Seq. ID No. 4599	Seq. ID No. 4600
2197b	Seq. ID No. 4601	Seq. ID No. 4602
2197c	Seq. ID No. 4603	Seq. ID No. 4604
2201a	Seq. ID No. 4605	Seq. ID No. 4606
2201b	Seq. ID No. 4607	Seq. ID No. 4608
2203	Seq. ID No. 4609	Seq. ID No. 4610
2204	Seq. ID No. 4611	Seq. ID No. 4612
2206a	Seq. ID No. 4613	Seq. ID No. 4614
2206b	Seq. ID No. 4615	Seq. ID No. 4616
2208a	Seq. ID No. 4617	Seq. ID No. 4618
2208b	Seq. ID No. 4619	Seq. ID No. 4620
2208c	Seq. ID No. 4621	Seq. ID No. 4622
2209	Seq. ID No. 4623	Seq. ID No. 4624
2212b	Seq. ID No. 4627	Seq. ID No. 4628
2215b	Seq. ID No. 4631	Seq. ID No. 4632
2218	Seq. ID No. 4637	Seq. ID No. 4638
2219b	Seq. ID No. 4641	Seq. ID No. 4642
2219c	Seq. ID No. 4643	Seq. ID No. 4644
2220a	Seq. ID No. 4645	Seq. ID No. 4646
2220b	Seq. ID No. 4647	Seq. ID No. 4648
2220c	Seq. ID No. 4649	Seq. ID No. 4650
2222	Seq. ID No. 4653	Seq. ID No. 4654
2225	Seq. ID No. 4659	Seq. ID No. 4660
2226	Seq. ID No. 4661	Seq. ID No. 4662

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2227	Seq. ID No. 4663	Seq. ID No. 4664
2228a	Seq. ID No. 4665	Seq. ID No. 4666
2228b	Seq. ID No. 4667	Seq. ID No. 4668
2228c	Seq. ID No. 4669	Seq. ID No. 4670
2231	Seq. ID No. 4671	Seq. ID No. 4672
2232	Seq. ID No. 4673	Seq. ID No. 4674
2234a	Seq. ID No. 4675	Seq. ID No. 4676
2234b	Seq. ID No. 4677	Seq. ID No. 4678
2234c	Seq. ID No. 4679	Seq. ID No. 4680
2236b	Seq. ID No. 4683	Seq. ID No. 4684
2238	Seq. ID No. 4685	Seq. ID No. 4686
2239b	Seq. ID No. 4687	Seq. ID No. 4688
2240b	Seq. ID No. 4691	Seq. ID No. 4692
2240c	Seq. ID No. 4693	Seq. ID No. 4694
2243a	Seq. ID No. 4695	Seq. ID No. 4696
2245	Seq. ID No. 4699	Seq. ID No. 4700
2246	Seq. ID No. 4701	Seq. ID No. 4702
2248	Seq. ID No. 4703	Seq. ID No. 4704
2249	Seq. ID No. 4705	Seq. ID No. 4706
2253d	Seq. ID No. 4713	Seq. ID No. 4714
2255b	Seq. ID No. 4717	Seq. ID No. 4718
2256	Seq. ID No. 4719	Seq. ID No. 4720
2257	Seq. ID No. 4721	Seq. ID No. 4722
2260b	Seq. ID No. 4727	Seq. ID No. 4728
2260c	Seq. ID No. 4729	Seq. ID No. 4730
2263	Seq. ID No. 4733	Seq. ID No. 4734
2264a	Seq. ID No. 4735	Seq. ID No. 4736
2264b	Seq. ID No. 4737	Seq. ID No. 4738
2267	Seq. ID No. 4739	Seq. ID No. 4740

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2268	Seq. ID No. 4741	Seq. ID No. 4742
2269	Seq. ID No. 4743	Seq. ID No. 4744
2272	Seq. ID No. 4747	Seq. ID No. 4748
2273	Seq. ID No. 4749	Seq. ID No. 4750
2274	Seq. ID No. 4751	Seq. ID No. 4752
2275b	Seq. ID No. 4755	Seq. ID No. 4756
2275c	Seq. ID No. 4757	Seq. ID No. 4758
2276c	Seq. ID No. 4763	Seq. ID No. 4764
2276d	Seq. ID No. 4765	Seq. ID No. 4766
2277a	Seq. ID No. 4767	Seq. ID No. 4768
2277b	Seq. ID No. 4769	Seq. ID No. 4770
2278b	Seq. ID No. 4773	Seq. ID No. 4774
2278c	Seq. ID No. 4775	Seq. ID No. 4776
2278d	Seq. ID No. 4777	Seq. ID No. 4778
2280	Seq. ID No. 4779	Seq. ID No. 4780
2284	Seq. ID No. 4781	Seq. ID No. 4782
2286b	Seq. ID No. 4787	Seq. ID No. 4788
2288	Seq. ID No. 4789	Seq. ID No. 4790
2290	Seq. ID No. 4791	Seq. ID No. 4792
2291a	Seq. ID No. 4793	Seq. ID No. 4794
2291b	Seq. ID No. 4795	Seq. ID No. 4796
2291c	Seq. ID No. 4797	Seq. ID No. 4798
2292b	Seq. ID No. 4801	Seq. ID No. 4802
2292c	Seq. ID No. 4803	Seq. ID No. 4804
2294	Seq. ID No. 4805	Seq. ID No. 4806
2298	Seq. ID No. 4809	Seq. ID No. 4810
2299	Seq. ID No. 4811	Seq. ID No. 4812
2300	Seq. ID No. 4813	Seq. ID No. 4814
2301	Seq. ID No. 4815	Seq. ID No. 4816

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2302	Seq. ID No. 4817	Seq. ID No. 4818
2303	Seq. ID No. 4819	Seq. ID No. 4820
2307	Seq. ID No. 4825	Seq. ID No. 4826
2308	Seq. ID No. 4827	Seq. ID No. 4828
2309a	Seq. ID No. 4829	Seq. ID No. 4830
2309b	Seq. ID No. 4831	Seq. ID No. 4832
2309c	Seq. ID No. 4833	Seq. ID No. 4834
2311	Seq. ID No. 4837	Seq. ID No. 4838
2312a	Seq. ID No. 4839	Seq. ID No. 4840
2312b	Seq. ID No. 4841	Seq. ID No. 4842
2312c	Seq. ID No. 4843	Seq. ID No. 4844
2314	Seq. ID No. 4845	Seq. ID No. 4846
2316	Seq. ID No. 4849	Seq. ID No. 4850
2317	Seq. ID No. 4851	Seq. ID No. 4852
2320	Seq. ID No. 4853	Seq. ID No. 4854
2321a	Seq. ID No. 4855	Seq. ID No. 4856
2322	Seq. ID No. 4861	Seq. ID No. 4862
2324	Seq. ID No. 4863	Seq. ID No. 4864
2328	Seq. ID No. 4867	Seq. ID No. 4868
2329d	Seq. ID No. 4875	Seq. ID No. 4876
2330	Seq. ID No. 4877	Seq. ID No. 4878
2331	Seq. ID No. 4879	Seq. ID No. 4880
2333	Seq. ID No. 4881	Seq. ID No. 4882
2335	Seq. ID No. 4883	Seq. ID No. 4884
2338a	Seq. ID No. 4889	Seq. ID No. 4890
2338b	Seq. ID No. 4891	Seq. ID No. 4892
2338c	Seq. ID No. 4893	Seq. ID No. 4894
2342a	Seq. ID No. 4895	Seq. ID No. 4896
2342b	Seq. ID No. 4897	Seq. ID No. 4898

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2342c	Seq. ID No. 4899	Seq. ID No. 4900
2344	Seq. ID No. 4901	Seq. ID No. 4902
2345	Seq. ID No. 4903	Seq. ID No. 4904
2347	Seq. ID No. 4905	Seq. ID No. 4906
2348	Seq. ID No. 4907	Seq. ID No. 4908
2349a	Seq. ID No. 4909	Seq. ID No. 4910
2349b	Seq. ID No. 4911	Seq. ID No. 4912
2350a	Seq. ID No. 4913	Seq. ID No. 4914
2353	Seq. ID No. 4915	Seq. ID No. 4916
2354	Seq. ID No. 4917	Seq. ID No. 4918
2357	Seq. ID No. 4919	Seq. ID No. 4920
2358	Seq. ID No. 4921	Seq. ID No. 4922
2360	Seq. ID No. 4923	Seq. ID No. 4924
2361b	Seq. ID No. 4927	Seq. ID No. 4928
2363b	Seq. ID No. 4931	Seq. ID No. 4932
2365b	Seq. ID No. 4935	Seq. ID No. 4936
2366a	Seq. ID No. 4937	Seq. ID No. 4938
2366b	Seq. ID No. 4939	Seq. ID No. 4940
2367	Seq. ID No. 4941	Seq. ID No. 4942
2368	Seq. ID No. 4943	Seq. ID No. 4944
2369	Seq. ID No. 4945	Seq. ID No. 4946
2370	Seq. ID No. 4947	Seq. ID No. 4948
2371a	Seq. ID No. 4949	Seq. ID No. 4950
2372	Seq. ID No. 4951	Seq. ID No. 4952
2373	Seq. ID No. 4953	Seq. ID No. 4954
2374b	Seq. ID No. 4957	Seq. ID No. 4958
2376	Seq. ID No. 4959	Seq. ID No. 4960
2377a	Seq. ID No. 4961	Seq. ID No. 4962
2377b	Seq. ID No. 4963	Seq. ID No. 4964

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2381	Seq. ID No. 4973	Seq. ID No. 4974
2382c	Seq. ID No. 4975	Seq. ID No. 4976
2384a	Seq. ID No. 4977	Seq. ID No. 4978
2384b	Seq. ID No. 4979	Seq. ID No. 4980
2386b	Seq. ID No. 4981	Seq. ID No. 4982
2386c	Seq. ID No. 4983	Seq. ID No. 4984
2387	Seq. ID No. 4985	Seq. ID No. 4986
2390	Seq. ID No. 4987	Seq. ID No. 4988
2391	Seq. ID No. 4989	Seq. ID No. 4990
2392	Seq. ID No. 4991	Seq. ID No. 4992
2394	Seq. ID No. 4993	Seq. ID No. 4994
2395	Seq. ID No. 4995	Seq. ID No. 4996
2396	Seq. ID No. 4997	Seq. ID No. 4998
2397	Seq. ID No. 4999	Seq. ID No. 5000
2399a	Seq. ID No. 5003	Seq. ID No. 5004
2399b	Seq. ID No. 5005	Seq. ID No. 5006
2399c	Seq. ID No. 5007	Seq. ID No. 5008
2401	Seq. ID No. 5009	Seq. ID No. 5010
2402a	Seq. ID No. 5011	Seq. ID No. 5012
2402b	Seq. ID No. 5013	Seq. ID No. 5014
2403b	Seq. ID No. 5017	Seq. ID No. 5018
2404a	Seq. ID No. 5019	Seq. ID No. 5020
2404b	Seq. ID No. 5021	Seq. ID No. 5022
2407a	Seq. ID No. 5023	Seq. ID No. 5024
2409a	Seq. ID No. 5025	Seq. ID No. 5026
2410	Seq. ID No. 5029	Seq. ID No. 5030
2412	Seq. ID No. 5031	Seq. ID No. 5032
2413a	Seq. ID No. 5033	Seq. ID No. 5034
2413b	Seq. ID No. 5035	Seq. ID No. 5036

**TABLE 20: WYETH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2416b	Seq. ID No. 5041	Seq. ID No. 5042
2416c	Seq. ID No. 5043	Seq. ID No. 5044
2417a	Seq. ID No. 5045	Seq. ID No. 5046
2417b	Seq. ID No. 5047	Seq. ID No. 5048
2422b	Seq. ID No. 5057	Seq. ID No. 5058
2422c	Seq. ID No. 5059	Seq. ID No. 5060
2423b	Seq. ID No. 5063	Seq. ID No. 5064
2424a	Seq. ID No. 5065	Seq. ID No. 5066
2424b	Seq. ID No. 5067	Seq. ID No. 5068
2424c	Seq. ID No. 5069	Seq. ID No. 5070
2428b	Seq. ID No. 5075	Seq. ID No. 5076
2428c	Seq. ID No. 5077	Seq. ID No. 5078
2429	Seq. ID No. 5079	Seq. ID No. 5080
2432	Seq. ID No. 5081	Seq. ID No. 5082
2433	Seq. ID No. 5083	Seq. ID No. 5084
2434	Seq. ID No. 5085	Seq. ID No. 5086
2440	Seq. ID No. 5087	Seq. ID No. 5088
2442b	Seq. ID No. 5091	Seq. ID No. 5092
2444c	Seq. ID No. 5099	Seq. ID No. 5100
2444d	Seq. ID No. 5101	Seq. ID No. 5102
2445	Seq. ID No. 5103	Seq. ID No. 5104
2449b	Seq. ID No. 5109	Seq. ID No. 5110
2451	Seq. ID No. 5111	Seq. ID No. 5112
2452	Seq. ID No. 5113	Seq. ID No. 5114
2453	Seq. ID No. 5115	Seq. ID No. 5116
2455	Seq. ID No. 5117	Seq. ID No. 5118
2456b	Seq. ID No. 5121	Seq. ID No. 5122
2456d	Seq. ID No. 5125	Seq. ID No. 5126
2456e	Seq. ID No. 5127	Seq. ID No. 5128



TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2458c	Seq. ID No. 5133	Seq. ID No. 5134
2458f	Seq. ID No. 5139	Seq. ID No. 5140
2458g	Seq. ID No. 5141	Seq. ID No. 5142
2461b	Seq. ID No. 5145	Seq. ID No. 5146
2462a	Seq. ID No. 5147	Seq. ID No. 5148
2462b	Seq. ID No. 5149	Seq. ID No. 5150
2463a	Seq. ID No. 5151	Seq. ID No. 5152
2465a	Seq. ID No. 5155	Seq. ID No. 5156
2465b	Seq. ID No. 5157	Seq. ID No. 5158
2468a	Seq. ID No. 5159	Seq. ID No. 5160
2468b	Seq. ID No. 5161	Seq. ID No. 5162
2469b	Seq. ID No. 5165	Seq. ID No. 5166
2470	Seq. ID No. 5167	Seq. ID No. 5168
2471	Seq. ID No. 5169	Seq. ID No. 5170
2474c	Seq. ID No. 5177	Seq. ID No. 5178
2475b	Seq. ID No. 5181	Seq. ID No. 5182
2475c	Seq. ID No. 5183	Seq. ID No. 5184
2477	Seq. ID No. 5185	Seq. ID No. 5186
2480	Seq. ID No. 5187	Seq. ID No. 5188
2481a	Seq. ID No. 5189	Seq. ID No. 5190
2481b	Seq. ID No. 5191	Seq. ID No. 5192
2482	Seq. ID No. 5193	Seq. ID No. 5194
2483	Seq. ID No. 5195	Seq. ID No. 5196
2484a	Seq. ID No. 5197	Seq. ID No. 5198
2484b	Seq. ID No. 5199	Seq. ID No. 5200
2485	Seq. ID No. 5201	Seq. ID No. 5202
2489	Seq. ID No. 5203	Seq. ID No. 5204
2490	Seq. ID No. 5205	Seq. ID No. 5206
2492b	Seq. ID No. 5209	Seq. ID No. 5210

**TABLE 20: WYETH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2494	Seq. ID No. 5211	Seq. ID No. 5212
2495b	Seq. ID No. 5215	Seq. ID No. 5216
2497b	Seq. ID No. 5219	Seq. ID No. 5220
2498b	Seq. ID No. 5221	Seq. ID No. 5222
2501a	Seq. ID No. 5229	Seq. ID No. 5230
2501b	Seq. ID No. 5231	Seq. ID No. 5232
2506	Seq. ID No. 5239	Seq. ID No. 5240
2507b	Seq. ID No. 5241	Seq. ID No. 5242
2507c	Seq. ID No. 5243	Seq. ID No. 5244
2510	Seq. ID No. 5245	Seq. ID No. 5246
2513b	Seq. ID No. 5251	Seq. ID No. 5252
2513c	Seq. ID No. 5253	Seq. ID No. 5254
2514	Seq. ID No. 5255	Seq. ID No. 5256
2516b	Seq. ID No. 5261	Seq. ID No. 5262
2517a	Seq. ID No. 5263	Seq. ID No. 5264
2517b	Seq. ID No. 5265	Seq. ID No. 5266
2518a	Seq. ID No. 5267	Seq. ID No. 5268
2520c	Seq. ID No. 5277	Seq. ID No. 5278
2520d	Seq. ID No. 5279	Seq. ID No. 5280
2521	Seq. ID No. 5281	Seq. ID No. 5282
2525a	Seq. ID No. 5285	Seq. ID No. 5286
2525b	Seq. ID No. 5287	Seq. ID No. 5288
2527b	Seq. ID No. 5291	Seq. ID No. 5292
2528b	Seq. ID No. 5295	Seq. ID No. 5296
2528c	Seq. ID No. 5297	Seq. ID No. 5298
2528d	Seq. ID No. 5299	Seq. ID No. 5300
2532b	Seq. ID No. 5301	Seq. ID No. 5302
2532c	Seq. ID No. 5303	Seq. ID No. 5304
2534	Seq. ID No. 5305	Seq. ID No. 5306

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2535a	Seq. ID No. 5307	Seq. ID No. 5308
2535b	Seq. ID No. 5309	Seq. ID No. 5310
2538	Seq. ID No. 5311	Seq. ID No. 5312
2541	Seq. ID No. 5313	Seq. ID No. 5314
2542b	Seq. ID No. 5317	Seq. ID No. 5318
2542c	Seq. ID No. 5319	Seq. ID No. 5320
2543	Seq. ID No. 5321	Seq. ID No. 5322
2544	Seq. ID No. 5323	Seq. ID No. 5324
2546	Seq. ID No. 5327	Seq. ID No. 5328
2547b	Seq. ID No. 5329	Seq. ID No. 5330
2547c	Seq. ID No. 5331	Seq. ID No. 5332
2548a	Seq. ID No. 5333	Seq. ID No. 5334
2548b	Seq. ID No. 5335	Seq. ID No. 5336
2549	Seq. ID No. 5337	Seq. ID No. 5338
2550e	Seq. ID No. 5343	Seq. ID No. 5344
2552	Seq. ID No. 5345	Seq. ID No. 5346
2554a	Seq. ID No. 5349	Seq. ID No. 5350
2554b	Seq. ID No. 5351	Seq. ID No. 5352
2555c	Seq. ID No. 5357	Seq. ID No. 5358
2555d	Seq. ID No. 5359	Seq. ID No. 5360
2559	Seq. ID No. 5365	Seq. ID No. 5366
2561	Seq. ID No. 5367	Seq. ID No. 5368
2563	Seq. ID No. 5373	Seq. ID No. 5374
2564b	Seq. ID No. 5377	Seq. ID No. 5378
2564c	Seq. ID No. 5379	Seq. ID No. 5380
2564d	Seq. ID No. 5381	Seq. ID No. 5382
2566	Seq. ID No. 5383	Seq. ID No. 5384
2567b	Seq. ID No. 5387	Seq. ID No. 5388
2568	Seq. ID No. 5389	Seq. ID No. 5390

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2572	Seq. ID No. 5391	Seq. ID No. 5392
2573	Seq. ID No. 5393	Seq. ID No. 5394
2576	Seq. ID No. 5397	Seq. ID No. 5398
2578	Seq. ID No. 5399	Seq. ID No. 5400
2579b	Seq. ID No. 5401	Seq. ID No. 5402
2581	Seq. ID No. 5403	Seq. ID No. 5404
2582a	Seq. ID No. 5405	Seq. ID No. 5406
2582b	Seq. ID No. 5407	Seq. ID No. 5408
2582c	Seq. ID No. 5409	Seq. ID No. 5410
2585	Seq. ID No. 5411	Seq. ID No. 5412
2587b	Seq. ID No. 5415	Seq. ID No. 5416
2588	Seq. ID No. 5417	Seq. ID No. 5418
2589	Seq. ID No. 5419	Seq. ID No. 5420
2591	Seq. ID No. 5421	Seq. ID No. 5422
2592	Seq. ID No. 5423	Seq. ID No. 5424
2593a	Seq. ID No. 5425	Seq. ID No. 5426
2593b	Seq. ID No. 5427	Seq. ID No. 5428
2594b	Seq. ID No. 5431	Seq. ID No. 5432
2596	Seq. ID No. 5433	Seq. ID No. 5434
2597a	Seq. ID No. 5435	Seq. ID No. 5436
2597b	Seq. ID No. 5437	Seq. ID No. 5438
2597c	Seq. ID No. 5439	Seq. ID No. 5440
2598	Seq. ID No. 5441	Seq. ID No. 5442
2602	Seq. ID No. 5443	Seq. ID No. 5444
2605b	Seq. ID No. 5447	Seq. ID No. 5448
2606	Seq. ID No. 5449	Seq. ID No. 5450
2608	Seq. ID No. 5451	Seq. ID No. 5452
2610	Seq. ID No. 5453	Seq. ID No. 5454
2611	Seq. ID No. 5455	Seq. ID No. 5456

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2613	Seq. ID No. 5457	Seq. ID No. 5458
2616e	Seq. ID No. 5467	Seq. ID No. 5468
2616g	Seq. ID No. 5471	Seq. ID No. 5472
2616h	Seq. ID No. 5473	Seq. ID No. 5474
2617b	Seq. ID No. 5477	Seq. ID No. 5478
2618a	Seq. ID No. 5479	Seq. ID No. 5480
2618b	Seq. ID No. 5481	Seq. ID No. 5482
2623b	Seq. ID No. 5491	Seq. ID No. 5492
2624a	Seq. ID No. 5493	Seq. ID No. 5494
2624b	Seq. ID No. 5495	Seq. ID No. 5496
2625b	Seq. ID No. 5499	Seq. ID No. 5500
2626b	Seq. ID No. 5503	Seq. ID No. 5504
2628	Seq. ID No. 5509	Seq. ID No. 5510
2629b	Seq. ID No. 5513	Seq. ID No. 5514
2631	Seq. ID No. 5515	Seq. ID No. 5516
2632	Seq. ID No. 5517	Seq. ID No. 5518
2633a	Seq. ID No. 5519	Seq. ID No. 5520
2633b	Seq. ID No. 5521	Seq. ID No. 5522
2633e	Seq. ID No. 5527	Seq. ID No. 5528
2637a	Seq. ID No. 5529	Seq. ID No. 5530
2637b	Seq. ID No. 5531	Seq. ID No. 5532
2642	Seq. ID No. 5533	Seq. ID No. 5534
2643b	Seq. ID No. 5537	Seq. ID No. 5538
2645	Seq. ID No. 5539	Seq. ID No. 5540
2647	Seq. ID No. 5541	Seq. ID No. 5542
2648a	Seq. ID No. 5543	Seq. ID No. 5544
2648b	Seq. ID No. 5545	Seq. ID No. 5546
2649	Seq. ID No. 5547	Seq. ID No. 5548
2650	Seq. ID No. 5549	Seq. ID No. 5550

**TABLE 20: WYETH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2652a	Seq. ID No. 5551	Seq. ID No. 5552
2652b	Seq. ID No. 5553	Seq. ID No. 5554
2655b	Seq. ID No. 5557	Seq. ID No. 5558
2656	Seq. ID No. 5559	Seq. ID No. 5560
2658b	Seq. ID No. 5563	Seq. ID No. 5564
2659b	Seq. ID No. 5567	Seq. ID No. 5568
2660	Seq. ID No. 5569	Seq. ID No. 5570
2664b	Seq. ID No. 5575	Seq. ID No. 5576
2665	Seq. ID No. 5577	Seq. ID No. 5578
2666b	Seq. ID No. 5581	Seq. ID No. 5582
2667a	Seq. ID No. 5583	Seq. ID No. 5584
2667b	Seq. ID No. 5585	Seq. ID No. 5586
2669b	Seq. ID No. 5589	Seq. ID No. 5590
2669c	Seq. ID No. 5591	Seq. ID No. 5592
2672	Seq. ID No. 5593	Seq. ID No. 5594
2673	Seq. ID No. 5595	Seq. ID No. 5596
2674b	Seq. ID No. 5599	Seq. ID No. 5600
2676	Seq. ID No. 5601	Seq. ID No. 5602
2677c	Seq. ID No. 5607	Seq. ID No. 5608
2679c	Seq. ID No. 5613	Seq. ID No. 5614
2679d	Seq. ID No. 5615	Seq. ID No. 5616
2680a	Seq. ID No. 5617	Seq. ID No. 5618
2680b	Seq. ID No. 5619	Seq. ID No. 5620
2680c	Seq. ID No. 5621	Seq. ID No. 5622
2683b	Seq. ID No. 5625	Seq. ID No. 5626
2684a	Seq. ID No. 5627	Seq. ID No. 5628
2684b	Seq. ID No. 5629	Seq. ID No. 5630
2686	Seq. ID No. 5631	Seq. ID No. 5632
2688c	Seq. ID No. 5637	Seq. ID No. 5638

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2689a	Seq. ID No. 5639	Seq. ID No. 5640
2689b	Seq. ID No. 5641	Seq. ID No. 5642
2690b	Seq. ID No. 5645	Seq. ID No. 5646
2690c	Seq. ID No. 5647	Seq. ID No. 5648
2692b	Seq. ID No. 5649	Seq. ID No. 5650
2693	Seq. ID No. 5651	Seq. ID No. 5652
2694b	Seq. ID No. 5655	Seq. ID No. 5656
2695	Seq. ID No. 5657	Seq. ID No. 5658
2696b	Seq. ID No. 5661	Seq. ID No. 5662
2709	Seq. ID No. 5665	Seq. ID No. 5666
2710c	Seq. ID No. 5667	Seq. ID No. 5668
2712	Seq. ID No. 5669	Seq. ID No. 5670
2716b	Seq. ID No. 5677	Seq. ID No. 5678
2716c	Seq. ID No. 5679	Seq. ID No. 5680
2718b	Seq. ID No. 5683	Seq. ID No. 5684
2718c	Seq. ID No. 5685	Seq. ID No. 5686
2719a	Seq. ID No. 5687	Seq. ID No. 5688
2719b	Seq. ID No. 5689	Seq. ID No. 5690
2721a	Seq. ID No. 5691	Seq. ID No. 5692
2721b	Seq. ID No. 5693	Seq. ID No. 5694
2722b	Seq. ID No. 5697	Seq. ID No. 5698
2723	Seq. ID No. 5699	Seq. ID No. 5700
2724	Seq. ID No. 5701	Seq. ID No. 5702
2725a	Seq. ID No. 5703	Seq. ID No. 5704
2725b	Seq. ID No. 5705	Seq. ID No. 5706
2726	Seq. ID No. 5707	Seq. ID No. 5708
2728b	Seq. ID No. 5711	Seq. ID No. 5712
2731a	Seq. ID No. 5713	Seq. ID No. 5714
2731b	Seq. ID No. 5715	Seq. ID No. 5716

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2732	Seq. ID No. 5717	Seq. ID No. 5718
2734a	Seq. ID No. 5719	Seq. ID No. 5720
2734b	Seq. ID No. 5721	Seq. ID No. 5722
2734c	Seq. ID No. 5723	Seq. ID No. 5724
2735a	Seq. ID No. 5725	Seq. ID No. 5726
2735b	Seq. ID No. 5727	Seq. ID No. 5728
2738d	Seq. ID No. 5735	Seq. ID No. 5736
2742b	Seq. ID No. 5739	Seq. ID No. 5740
2743a	Seq. ID No. 5741	Seq. ID No. 5742
2743b	Seq. ID No. 5743	Seq. ID No. 5744
2744	Seq. ID No. 5745	Seq. ID No. 5746
2745a	Seq. ID No. 5747	Seq. ID No. 5748
2745b	Seq. ID No. 5749	Seq. ID No. 5750
2746	Seq. ID No. 5751	Seq. ID No. 5752
2747a	Seq. ID No. 5753	Seq. ID No. 5754
2747b	Seq. ID No. 5755	Seq. ID No. 5756
2748a	Seq. ID No. 5757	Seq. ID No. 5758
2748b	Seq. ID No. 5759	Seq. ID No. 5760
2748c	Seq. ID No. 5761	Seq. ID No. 5762
2749d	Seq. ID No. 5769	Seq. ID No. 5770
2749e	Seq. ID No. 5771	Seq. ID No. 5772
2752	Seq. ID No. 5777	Seq. ID No. 5778
2753	Seq. ID No. 5779	Seq. ID No. 5780
2757b	Seq. ID No. 5783	Seq. ID No. 5784
2758b	Seq. ID No. 5787	Seq. ID No. 5788
2758d	Seq. ID No. 5791	Seq. ID No. 5792
2759b	Seq. ID No. 5795	Seq. ID No. 5796
2760b	Seq. ID No. 5799	Seq. ID No. 5800
2760c	Seq. ID No. 5801	Seq. ID No. 5802



TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2763b	Seq. ID No. 5807	Seq. ID No. 5808
2763c	Seq. ID No. 5809	Seq. ID No. 5810
2765b	Seq. ID No. 5813	Seq. ID No. 5814
2765c	Seq. ID No. 5815	Seq. ID No. 5816
2766b	Seq. ID No. 5819	Seq. ID No. 5820
2768a	Seq. ID No. 5821	Seq. ID No. 5822
2768b	Seq. ID No. 5823	Seq. ID No. 5824
2768c	Seq. ID No. 5825	Seq. ID No. 5826
2769a	Seq. ID No. 5827	Seq. ID No. 5828
2770	Seq. ID No. 5829	Seq. ID No. 5830
2771a	Seq. ID No. 5831	Seq. ID No. 5832
2771b	Seq. ID No. 5833	Seq. ID No. 5834
2773	Seq. ID No. 5835	Seq. ID No. 5836
2774a	Seq. ID No. 5837	Seq. ID No. 5838
2774b	Seq. ID No. 5839	Seq. ID No. 5840
2774c	Seq. ID No. 5841	Seq. ID No. 5842
2776b	Seq. ID No. 5845	Seq. ID No. 5846
2777	Seq. ID No. 5847	Seq. ID No. 5848
2778	Seq. ID No. 5849	Seq. ID No. 5850
2779	Seq. ID No. 5851	Seq. ID No. 5852
2784	Seq. ID No. 5855	Seq. ID No. 5856
2785a	Seq. ID No. 5857	Seq. ID No. 5858
2785b	Seq. ID No. 5859	Seq. ID No. 5860
2786a	Seq. ID No. 5861	Seq. ID No. 5862
2786b	Seq. ID No. 5863	Seq. ID No. 5864
2786c	Seq. ID No. 5865	Seq. ID No. 5866
2787b	Seq. ID No. 5869	Seq. ID No. 5870
2787c	Seq. ID No. 5871	Seq. ID No. 5872
2788b	Seq. ID No. 5873	Seq. ID No. 5874

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2789	Seq. ID No. 5875	Seq. ID No. 5876
2791	Seq. ID No. 5879	Seq. ID No. 5880
2793	Seq. ID No. 5881	Seq. ID No. 5882
2794	Seq. ID No. 5883	Seq. ID No. 5884
2799a	Seq. ID No. 5889	Seq. ID No. 5890
2801b	Seq. ID No. 5895	Seq. ID No. 5896
2804	Seq. ID No. 5897	Seq. ID No. 5898
2805b	Seq. ID No. 5901	Seq. ID No. 5902
2809	Seq. ID No. 5903	Seq. ID No. 5904
2810d	Seq. ID No. 5911	Seq. ID No. 5912
2812	Seq. ID No. 5913	Seq. ID No. 5914
2814	Seq. ID No. 5915	Seq. ID No. 5916
2815	Seq. ID No. 5917	Seq. ID No. 5918
2816	Seq. ID No. 5919	Seq. ID No. 5920
2818d	Seq. ID No. 5927	Seq. ID No. 5928
2818e	Seq. ID No. 5929	Seq. ID No. 5930
2820	Seq. ID No. 5933	Seq. ID No. 5934
2821a	Seq. ID No. 5935	Seq. ID No. 5936
2821b	Seq. ID No. 5937	Seq. ID No. 5938
2822b	Seq. ID No. 5941	Seq. ID No. 5942
2824a	Seq. ID No. 5945	Seq. ID No. 5946
2824b	Seq. ID No. 5947	Seq. ID No. 5948
2829b	Seq. ID No. 5951	Seq. ID No. 5952
2834a	Seq. ID No. 5959	Seq. ID No. 5960
2834b	Seq. ID No. 5961	Seq. ID No. 5962
2837a	Seq. ID No. 5963	Seq. ID No. 5964
2837b	Seq. ID No. 5965	Seq. ID No. 5966
2842a	Seq. ID No. 5967	Seq. ID No. 5968
2842b	Seq. ID No. 5969	Seq. ID No. 5970

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2843a	Seq. ID No. 5971	Seq. ID No. 5972
2843b	Seq. ID No. 5973	Seq. ID No. 5974
2846a	Seq. ID No. 5977	Seq. ID No. 5978
2846b	Seq. ID No. 5979	Seq. ID No. 5980
2848	Seq. ID No. 5981	Seq. ID No. 5982
2851	Seq. ID No. 5985	Seq. ID No. 5986
2852	Seq. ID No. 5987	Seq. ID No. 5988
2853	Seq. ID No. 5989	Seq. ID No. 5990
2854a	Seq. ID No. 5991	Seq. ID No. 5992
2854b	Seq. ID No. 5993	Seq. ID No. 5994
2855	Seq. ID No. 5995	Seq. ID No. 5996
2856b	Seq. ID No. 5999	Seq. ID No. 6000
2856c	Seq. ID No. 6001	Seq. ID No. 6002
2857	Seq. ID No. 6003	Seq. ID No. 6004
2860b	Seq. ID No. 6009	Seq. ID No. 6010
2860c	Seq. ID No. 6011	Seq. ID No. 6012
2862	Seq. ID No. 6013	Seq. ID No. 6014
2863	Seq. ID No. 6015	Seq. ID No. 6016
2864	Seq. ID No. 6017	Seq. ID No. 6018
2869b	Seq. ID No. 6025	Seq. ID No. 6026
2869c	Seq. ID No. 6027	Seq. ID No. 6028
2871	Seq. ID No. 6029	Seq. ID No. 6030
2872	Seq. ID No. 6031	Seq. ID No. 6032
2875	Seq. ID No. 6033	Seq. ID No. 6034
2877	Seq. ID No. 6035	Seq. ID No. 6036
2879b	Seq. ID No. 6039	Seq. ID No. 6040
2879c	Seq. ID No. 6041	Seq. ID No. 6042
2881	Seq. ID No. 6043	Seq. ID No. 6044
2882	Seq. ID No. 6045	Seq. ID No. 6046

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2883b	Seq. ID No. 6049	Seq. ID No. 6050
2883c	Seq. ID No. 6051	Seq. ID No. 6052
2883d	Seq. ID No. 6053	Seq. ID No. 6054
2886a	Seq. ID No. 6055	Seq. ID No. 6056
2886b	Seq. ID No. 6057	Seq. ID No. 6058
2887b	Seq. ID No. 6061	Seq. ID No. 6062
2888	Seq. ID No. 6063	Seq. ID No. 6064
2890	Seq. ID No. 6065	Seq. ID No. 6066
2891b	Seq. ID No. 6069	Seq. ID No. 6070
2891c	Seq. ID No. 6071	Seq. ID No. 6072
2893b	Seq. ID No. 6073	Seq. ID No. 6074
2894b	Seq. ID No. 6077	Seq. ID No. 6078
2894c	Seq. ID No. 6079	Seq. ID No. 6080
2897b	Seq. ID No. 6085	Seq. ID No. 6086
2900a	Seq. ID No. 6087	Seq. ID No. 6088
2900b	Seq. ID No. 6089	Seq. ID No. 6090
2901b	Seq. ID No. 6093	Seq. ID No. 6094
2902	Seq. ID No. 6095	Seq. ID No. 6096
2905b	Seq. ID No. 6101	Seq. ID No. 6102
2906	Seq. ID No. 6103	Seq. ID No. 6104
2909c	Seq. ID No. 6109	Seq. ID No. 6110
2909d	Seq. ID No. 6111	Seq. ID No. 6112
2913b	Seq. ID No. 6117	Seq. ID No. 6118
2915b	Seq. ID No. 6121	Seq. ID No. 6122
2915c	Seq. ID No. 6123	Seq. ID No. 6124
2918	Seq. ID No. 6129	Seq. ID No. 6130
2920	Seq. ID No. 6131	Seq. ID No. 6132
2921	Seq. ID No. 6133	Seq. ID No. 6134
2922b	Seq. ID No. 6135	Seq. ID No. 6136

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2923a	Seq. ID No. 6137	Seq. ID No. 6138
2923b	Seq. ID No. 6139	Seq. ID No. 6140
2923c	Seq. ID No. 6141	Seq. ID No. 6142
2925b	Seq. ID No. 6145	Seq. ID No. 6146
2926c	Seq. ID No. 6151	Seq. ID No. 6152
2928b	Seq. ID No. 6155	Seq. ID No. 6156
2928c	Seq. ID No. 6157	Seq. ID No. 6158
2929b	Seq. ID No. 6159	Seq. ID No. 6160
2931c	Seq. ID No. 6165	Seq. ID No. 6166
2933a	Seq. ID No. 6167	Seq. ID No. 6168
2933b	Seq. ID No. 6169	Seq. ID No. 6170
2934	Seq. ID No. 6171	Seq. ID No. 6172
2935b	Seq. ID No. 6175	Seq. ID No. 6176
2936	Seq. ID No. 6177	Seq. ID No. 6178
2939b	Seq. ID No. 6181	Seq. ID No. 6182
2941c	Seq. ID No. 6187	Seq. ID No. 6188
2943c	Seq. ID No. 6193	Seq. ID No. 6194
2943d	Seq. ID No. 6195	Seq. ID No. 6196
2944b	Seq. ID No. 6197	Seq. ID No. 6198
2945b	Seq. ID No. 6199	Seq. ID No. 6200
2947	Seq. ID No. 6201	Seq. ID No. 6202
2948d	Seq. ID No. 6209	Seq. ID No. 6210
2950b	Seq. ID No. 6213	Seq. ID No. 6214
2951	Seq. ID No. 6215	Seq. ID No. 6216
2952	Seq. ID No. 6217	Seq. ID No. 6218
2954	Seq. ID No. 6219	Seq. ID No. 6220
2955f	Seq. ID No. 6231	Seq. ID No. 6232
2955g	Seq. ID No. 6233	Seq. ID No. 6234
2957	Seq. ID No. 6235	Seq. ID No. 6236

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2958b	Seq. ID No. 6239	Seq. ID No. 6240
2958c	Seq. ID No. 6241	Seq. ID No. 6242
2959	Seq. ID No. 6243	Seq. ID No. 6244
2962b	Seq. ID No. 6249	Seq. ID No. 6250
2965c	Seq. ID No. 6257	Seq. ID No. 6258
2966	Seq. ID No. 6259	Seq. ID No. 6260
2967	Seq. ID No. 6261	Seq. ID No. 6262
2969	Seq. ID No. 6263	Seq. ID No. 6264
2970b	Seq. ID No. 6267	Seq. ID No. 6268
2971a	Seq. ID No. 6269	Seq. ID No. 6270
2971b	Seq. ID No. 6271	Seq. ID No. 6272
2974b	Seq. ID No. 6275	Seq. ID No. 6276
2975	Seq. ID No. 6277	Seq. ID No. 6278
2977a	Seq. ID No. 6279	Seq. ID No. 6280
2977b	Seq. ID No. 6281	Seq. ID No. 6282
2978a	Seq. ID No. 6283	Seq. ID No. 6284
2978b	Seq. ID No. 6285	Seq. ID No. 6286
2979	Seq. ID No. 6287	Seq. ID No. 6288
2980c	Seq. ID No. 6293	Seq. ID No. 6294
2980d	Seq. ID No. 6295	Seq. ID No. 6296
2980e	Seq. ID No. 6297	Seq. ID No. 6298
2984	Seq. ID No. 6299	Seq. ID No. 6300
2986c	Seq. ID No. 6305	Seq. ID No. 6306
2988b	Seq. ID No. 6309	Seq. ID No. 6310
2988c	Seq. ID No. 6311	Seq. ID No. 6312
2990	Seq. ID No. 6315	Seq. ID No. 6316
2991a	Seq. ID No. 6317	Seq. ID No. 6318
2991b	Seq. ID No. 6319	Seq. ID No. 6320
2991c	Seq. ID No. 6321	Seq. ID No. 6322

**TABLE 20: WYETH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2992	Seq. ID No. 6323	Seq. ID No. 6324
2993a	Seq. ID No. 6325	Seq. ID No. 6326
2993b	Seq. ID No. 6327	Seq. ID No. 6328
2995a	Seq. ID No. 6329	Seq. ID No. 6330
2995b	Seq. ID No. 6331	Seq. ID No. 6332
2998a	Seq. ID No. 6335	Seq. ID No. 6336
2998b	Seq. ID No. 6337	Seq. ID No. 6338
3001	Seq. ID No. 6341	Seq. ID No. 6342
3005	Seq. ID No. 6345	Seq. ID No. 6346
3008b	Seq. ID No. 6349	Seq. ID No. 6350
3008c	Seq. ID No. 6351	Seq. ID No. 6352
3008d	Seq. ID No. 6353	Seq. ID No. 6354
3012	Seq. ID No. 6359	Seq. ID No. 6360
3015	Seq. ID No. 6361	Seq. ID No. 6362
3016c	Seq. ID No. 6367	Seq. ID No. 6368
3017	Seq. ID No. 6369	Seq. ID No. 6370
3018a	Seq. ID No. 6371	Seq. ID No. 6372
3018b	Seq. ID No. 6373	Seq. ID No. 6374
3020	Seq. ID No. 6375	Seq. ID No. 6376
3021	Seq. ID No. 6377	Seq. ID No. 6378
3022	Seq. ID No. 6379	Seq. ID No. 6380
3023	Seq. ID No. 6381	Seq. ID No. 6382
3024b	Seq. ID No. 6385	Seq. ID No. 6386
3026b	Seq. ID No. 6389	Seq. ID No. 6390
3028b	Seq. ID No. 6393	Seq. ID No. 6394
3028c	Seq. ID No. 6395	Seq. ID No. 6396
3029b	Seq. ID No. 6399	Seq. ID No. 6400
3033a	Seq. ID No. 6409	Seq. ID No. 6410
3033b	Seq. ID No. 6411	Seq. ID No. 6412

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3035	Seq. ID No. 6413	Seq. ID No. 6414
3037b	Seq. ID No. 6417	Seq. ID No. 6418
3040a	Seq. ID No. 6421	Seq. ID No. 6422
3040b	Seq. ID No. 6423	Seq. ID No. 6424
3042a	Seq. ID No. 6425	Seq. ID No. 6426
3042b	Seq. ID No. 6427	Seq. ID No. 6428
3043a	Seq. ID No. 6429	Seq. ID No. 6430
3043b	Seq. ID No. 6431	Seq. ID No. 6432
3049a	Seq. ID No. 6441	Seq. ID No. 6442
3049b	Seq. ID No. 6443	Seq. ID No. 6444
3049c	Seq. ID No. 6445	Seq. ID No. 6446
3052	Seq. ID No. 6451	Seq. ID No. 6452
3054	Seq. ID No. 6453	Seq. ID No. 6454
3057	Seq. ID No. 6459	Seq. ID No. 6460
3059	Seq. ID No. 6461	Seq. ID No. 6462
3060	Seq. ID No. 6463	Seq. ID No. 6464
3061	Seq. ID No. 6465	Seq. ID No. 6466
3062	Seq. ID No. 6467	Seq. ID No. 6468
3063a	Seq. ID No. 6469	Seq. ID No. 6470
3063b	Seq. ID No. 6471	Seq. ID No. 6472
3064b	Seq. ID No. 6473	Seq. ID No. 6474
3066	Seq. ID No. 6479	Seq. ID No. 6480
3068	Seq. ID No. 6483	Seq. ID No. 6484
3074	Seq. ID No. 6493	Seq. ID No. 6494
3075	Seq. ID No. 6495	Seq. ID No. 6496
3076	Seq. ID No. 6497	Seq. ID No. 6498
3077b	Seq. ID No. 6501	Seq. ID No. 6502
3077c	Seq. ID No. 6503	Seq. ID No. 6504
3078	Seq. ID No. 6505	Seq. ID No. 6506



TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3079	Seq. ID No. 6507	Seq. ID No. 6508
3081b	Seq. ID No. 6511	Seq. ID No. 6512
3085	Seq. ID No. 6517	Seq. ID No. 6518
3087c	Seq. ID No. 6523	Seq. ID No. 6524
3088	Seq. ID No. 6525	Seq. ID No. 6526
3092a	Seq. ID No. 6535	Seq. ID No. 6536
3092b	Seq. ID No. 6537	Seq. ID No. 6538
3095	Seq. ID No. 6539	Seq. ID No. 6540
3096a	Seq. ID No. 6541	Seq. ID No. 6542
3096b	Seq. ID No. 6543	Seq. ID No. 6544
3097	Seq. ID No. 6545	Seq. ID No. 6546
3098a	Seq. ID No. 6547	Seq. ID No. 6548
3098b	Seq. ID No. 6549	Seq. ID No. 6550
3098c	Seq. ID No. 6551	Seq. ID No. 6552
3099	Seq. ID No. 6553	Seq. ID No. 6554
3100a	Seq. ID No. 6555	Seq. ID No. 6556
3100b	Seq. ID No. 6557	Seq. ID No. 6558
3101	Seq. ID No. 6559	Seq. ID No. 6560
3103b	Seq. ID No. 6563	Seq. ID No. 6564
3107b	Seq. ID No. 6573	Seq. ID No. 6574
3108a	Seq. ID No. 6575	Seq. ID No. 6576
3108b	Seq. ID No. 6577	Seq. ID No. 6578
3109	Seq. ID No. 6579	Seq. ID No. 6580
3110b	Seq. ID No. 6583	Seq. ID No. 6584
3113	Seq. ID No. 6585	Seq. ID No. 6586
3116	Seq. ID No. 6587	Seq. ID No. 6588
3118b	Seq. ID No. 6591	Seq. ID No. 6592
3119c	Seq. ID No. 6597	Seq. ID No. 6598
3119e	Seq. ID No. 6601	Seq. ID No. 6602

**TABLE 20: WYETH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
3119f	Seq. ID No. 6603	Seq. ID No. 6604
3121	Seq. ID No. 6605	Seq. ID No. 6606
3122b	Seq. ID No. 6609	Seq. ID No. 6610
3123a	Seq. ID No. 6611	Seq. ID No. 6612
3123b	Seq. ID No. 6613	Seq. ID No. 6614
3124	Seq. ID No. 6615	Seq. ID No. 6616
3126	Seq. ID No. 6617	Seq. ID No. 6618
3129a	Seq. ID No. 6619	Seq. ID No. 6620
3129b	Seq. ID No. 6621	Seq. ID No. 6622
3131	Seq. ID No. 6623	Seq. ID No. 6624
3134b	Seq. ID No. 6627	Seq. ID No. 6628
3138	Seq. ID No. 6629	Seq. ID No. 6630
3140	Seq. ID No. 6631	Seq. ID No. 6632
3141	Seq. ID No. 6633	Seq. ID No. 6634
3145b	Seq. ID No. 6637	Seq. ID No. 6638
3145c	Seq. ID No. 6639	Seq. ID No. 6640
3147b	Seq. ID No. 6643	Seq. ID No. 6644
3147c	Seq. ID No. 6645	Seq. ID No. 6646
3150a	Seq. ID No. 6649	Seq. ID No. 6650

Listed in Table 21, are 615 ORFs detected by another ORF finder program (Signal Search) of Applicant's assignee that searches for transmembrane regions between two Stop codons and a Start codon immediately upstream of the transmembrane region.

5

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
4a	Seq. ID No. 7	Seq. ID No. 8
4b	Seq. ID No. 9	Seq. ID No. 10

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
23a	Seq. ID No. 33	Seq. ID No. 34
38b	Seq. ID No. 47	Seq. ID No. 48
44b	Seq. ID No. 67	Seq. ID No. 68
51a	Seq. ID No. 85	Seq. ID No. 86
51b	Seq. ID No. 87	Seq. ID No. 88
66a	Seq. ID No. 123	Seq. ID No. 124
73b	Seq. ID No. 133	Seq. ID No. 134
80a	Seq. ID No. 141	Seq. ID No. 142
86	Seq. ID No. 159	Seq. ID No. 160
87b	Seq. ID No. 163	Seq. ID No. 164
99	Seq. ID No. 191	Seq. ID No. 192
109a	Seq. ID No. 209	Seq. ID No. 210
109b	Seq. ID No. 211	Seq. ID No. 212
109d	Seq. ID No. 215	Seq. ID No. 216
111a	Seq. ID No. 217	Seq. ID No. 218
114	Seq. ID No. 225	Seq. ID No. 226
124a	Seq. ID No. 235	Seq. ID No. 236
124b	Seq. ID No. 237	Seq. ID No. 238
129a	Seq. ID No. 249	Seq. ID No. 250
129b	Seq. ID No. 251	Seq. ID No. 252
132a	Seq. ID No. 255	Seq. ID No. 256
138a	Seq. ID No. 271	Seq. ID No. 272
143	Seq. ID No. 277	Seq. ID No. 278
145a	Seq. ID No. 285	Seq. ID No. 286
145b	Seq. ID No. 287	Seq. ID No. 288
145c	Seq. ID No. 289	Seq. ID No. 290
162a	Seq. ID No. 327	Seq. ID No. 328
162b	Seq. ID No. 329	Seq. ID No. 330
180a	Seq. ID No. 373	Seq. ID No. 374

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
180b	Seq. ID No. 375	Seq. ID No. 376
201a	Seq. ID No. 419	Seq. ID No. 420
239a	Seq. ID No. 487	Seq. ID No. 488
245a	Seq. ID No. 497	Seq. ID No. 498
245b	Seq. ID No. 499	Seq. ID No. 500
246a	Seq. ID No. 503	Seq. ID No. 504
246b	Seq. ID No. 505	Seq. ID No. 506
248a	Seq. ID No. 509	Seq. ID No. 510
248b	Seq. ID No. 511	Seq. ID No. 512
249b	Seq. ID No. 515	Seq. ID No. 516
255a	Seq. ID No. 525	Seq. ID No. 526
255b	Seq. ID No. 527	Seq. ID No. 528
263a	Seq. ID No. 545	Seq. ID No. 546
273a	Seq. ID No. 567	Seq. ID No. 568
273b	Seq. ID No. 569	Seq. ID No. 570
277c	Seq. ID No. 575	Seq. ID No. 576
279a	Seq. ID No. 577	Seq. ID No. 578
279b	Seq. ID No. 579	Seq. ID No. 580
283b	Seq. ID No. 593	Seq. ID No. 594
297	Seq. ID No. 617	Seq. ID No. 618
311	Seq. ID No. 637	Seq. ID No. 638
313a	Seq. ID No. 639	Seq. ID No. 640
313b	Seq. ID No. 641	Seq. ID No. 642
313d	Seq. ID No. 645	Seq. ID No. 646
317a	Seq. ID No. 653	Seq. ID No. 654
317b	Seq. ID No. 655	Seq. ID No. 656
318b	Seq. ID No. 659	Seq. ID No. 660
321	Seq. ID No. 669	Seq. ID No. 670
324	Seq. ID No. 675	Seq. ID No. 676

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
327a	Seq. ID No. 677	Seq. ID No. 678
327b	Seq. ID No. 679	Seq. ID No. 680
342a	Seq. ID No. 715	Seq. ID No. 716
342b	Seq. ID No. 717	Seq. ID No. 718
342c	Seq. ID No. 719	Seq. ID No. 720
342d	Seq. ID No. 721	Seq. ID No. 722
342e	Seq. ID No. 723	Seq. ID No. 724
349c	Seq. ID No. 747	Seq. ID No. 748
350b	Seq. ID No. 751	Seq. ID No. 752
352a	Seq. ID No. 755	Seq. ID No. 756
352b	Seq. ID No. 757	Seq. ID No. 758
352c	Seq. ID No. 759	Seq. ID No. 760
354a	Seq. ID No. 761	Seq. ID No. 762
354b	Seq. ID No. 763	Seq. ID No. 764
356a	Seq. ID No. 769	Seq. ID No. 770
358a	Seq. ID No. 777	Seq. ID No. 778
358b	Seq. ID No. 779	Seq. ID No. 780
372d	Seq. ID No. 807	Seq. ID No. 808
374	Seq. ID No. 809	Seq. ID No. 810
382b	Seq. ID No. 819	Seq. ID No. 820
384a	Seq. ID No. 825	Seq. ID No. 826
403b	Seq. ID No. 863	Seq. ID No. 864
418a	Seq. ID No. 893	Seq. ID No. 894
419c	Seq. ID No. 901	Seq. ID No. 902
431	Seq. ID No. 935	Seq. ID No. 936
437c	Seq. ID No. 943	Seq. ID No. 944
441b	Seq. ID No. 955	Seq. ID No. 956
448	Seq. ID No. 967	Seq. ID No. 968
452b	Seq. ID No. 979	Seq. ID No. 980

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
462	Seq. ID No. 1005	Seq. ID No. 1006
463b	Seq. ID No. 1009	Seq. ID No. 1010
464a	Seq. ID No. 1011	Seq. ID No. 1012
464b	Seq. ID No. 1013	Seq. ID No. 1014
464c	Seq. ID No. 1015	Seq. ID No. 1016
465b	Seq. ID No. 1019	Seq. ID No. 1020
472a	Seq. ID No. 1029	Seq. ID No. 1030
472b	Seq. ID No. 1031	Seq. ID No. 1032
472c	Seq. ID No. 1033	Seq. ID No. 1034
472e	Seq. ID No. 1037	Seq. ID No. 1038
472f	Seq. ID No. 1039	Seq. ID No. 1040
476	Seq. ID No. 1045	Seq. ID No. 1046
480a	Seq. ID No. 1055	Seq. ID No. 1056
492	Seq. ID No. 1075	Seq. ID No. 1076
507a	Seq. ID No. 1105	Seq. ID No. 1106
521b	Seq. ID No. 1131	Seq. ID No. 1132
524a	Seq. ID No. 1135	Seq. ID No. 1136
524b	Seq. ID No. 1137	Seq. ID No. 1138
541a	Seq. ID No. 1165	Seq. ID No. 1166
541b	Seq. ID No. 1167	Seq. ID No. 1168
541c	Seq. ID No. 1169	Seq. ID No. 1170
545a	Seq. ID No. 1183	Seq. ID No. 1184
546c	Seq. ID No. 1193	Seq. ID No. 1194
547b	Seq. ID No. 1197	Seq. ID No. 1198
556	Seq. ID No. 1213	Seq. ID No. 1214
561	Seq. ID No. 1223	Seq. ID No. 1224
564a	Seq. ID No. 1227	Seq. ID No. 1228
564b	Seq. ID No. 1229	Seq. ID No. 1230
570b	Seq. ID No. 1237	Seq. ID No. 1238

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
576a	Seq. ID No. 1243	Seq. ID No. 1244
587a	Seq. ID No. 1265	Seq. ID No. 1266
587b	Seq. ID No. 1267	Seq. ID No. 1268
587c	Seq. ID No. 1269	Seq. ID No. 1270
587d	Seq. ID No. 1271	Seq. ID No. 1272
595a	Seq. ID No. 1283	Seq. ID No. 1284
596a	Seq. ID No. 1287	Seq. ID No. 1288
596c	Seq. ID No. 1291	Seq. ID No. 1292
598b	Seq. ID No. 1297	Seq. ID No. 1298
600b	Seq. ID No. 1305	Seq. ID No. 1306
609a	Seq. ID No. 1315	Seq. ID No. 1316
613a	Seq. ID No. 1325	Seq. ID No. 1326
613b	Seq. ID No. 1327	Seq. ID No. 1328
613c	Seq. ID No. 1329	Seq. ID No. 1330
613d	Seq. ID No. 1331	Seq. ID No. 1332
619a	Seq. ID No. 1341	Seq. ID No. 1342
624c	Seq. ID No. 1353	Seq. ID No. 1354
631c	Seq. ID No. 1367	Seq. ID No. 1368
645	Seq. ID No. 1401	Seq. ID No. 1402
665	Seq. ID No. 1429	Seq. ID No. 1430
674a	Seq. ID No. 1435	Seq. ID No. 1436
679a	Seq. ID No. 1445	Seq. ID No. 1446
700a	Seq. ID No. 1481	Seq. ID No. 1482
722a	Seq. ID No. 1513	Seq. ID No. 1514
722b	Seq. ID No. 1515	Seq. ID No. 1516
722c	Seq. ID No. 1517	Seq. ID No. 1518
728a	Seq. ID No. 1529	Seq. ID No. 1530
730a	Seq. ID No. 1533	Seq. ID No. 1534
730b	Seq. ID No. 1535	Seq. ID No. 1536

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
738a	Seq. ID No. 1545	Seq. ID No. 1546
738b	Seq. ID No. 1547	Seq. ID No. 1548
739	Seq. ID No. 1551	Seq. ID No. 1552
743a	Seq. ID No. 1559	Seq. ID No. 1560
744	Seq. ID No. 1563	Seq. ID No. 1564
746b	Seq. ID No. 1571	Seq. ID No. 1572
749	Seq. ID No. 1579	Seq. ID No. 1580
754a	Seq. ID No. 1583	Seq. ID No. 1584
754b	Seq. ID No. 1585	Seq. ID No. 1586
772a	Seq. ID No. 1621	Seq. ID No. 1622
779	Seq. ID No. 1633	Seq. ID No. 1634
786b	Seq. ID No. 1643	Seq. ID No. 1644
788a	Seq. ID No. 1645	Seq. ID No. 1646
788b	Seq. ID No. 1647	Seq. ID No. 1648
789a	Seq. ID No. 1649	Seq. ID No. 1650
789c	Seq. ID No. 1653	Seq. ID No. 1654
799a	Seq. ID No. 1671	Seq. ID No. 1672
799b	Seq. ID No. 1673	Seq. ID No. 1674
799d	Seq. ID No. 1677	Seq. ID No. 1678
799f	Seq. ID No. 1681	Seq. ID No. 1682
826	Seq. ID No. 1707	Seq. ID No. 1708
837a	Seq. ID No. 1731	Seq. ID No. 1732
837b	Seq. ID No. 1733	Seq. ID No. 1734
843	Seq. ID No. 1737	Seq. ID No. 1738
853a	Seq. ID No. 1753	Seq. ID No. 1754
853c	Seq. ID No. 1757	Seq. ID No. 1758
859a	Seq. ID No. 1765	Seq. ID No. 1766
859b	Seq. ID No. 1767	Seq. ID No. 1768
868a	Seq. ID No. 1787	Seq. ID No. 1788



TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
870	Seq. ID No. 1791	Seq. ID No. 1792
873c	Seq. ID No. 1797	Seq. ID No. 1798
876	Seq. ID No. 1805	Seq. ID No. 1806
885	Seq. ID No. 1819	Seq. ID No. 1820
886	Seq. ID No. 1821	Seq. ID No. 1822
887	Seq. ID No. 1823	Seq. ID No. 1824
908a	Seq. ID No. 1839	Seq. ID No. 1840
929a	Seq. ID No. 1869	Seq. ID No. 1870
931	Seq. ID No. 1875	Seq. ID No. 1876
939a	Seq. ID No. 1891	Seq. ID No. 1892
939b	Seq. ID No. 1893	Seq. ID No. 1894
939c	Seq. ID No. 1895	Seq. ID No. 1896
952b	Seq. ID No. 1923	Seq. ID No. 1924
955a	Seq. ID No. 1927	Seq. ID No. 1928
977a	Seq. ID No. 1969	Seq. ID No. 1970
981a	Seq. ID No. 1981	Seq. ID No. 1982
987	Seq. ID No. 1991	Seq. ID No. 1992
988a	Seq. ID No. 1993	Seq. ID No. 1994
998a	Seq. ID No. 2013	Seq. ID No. 2014
999a	Seq. ID No. 2017	Seq. ID No. 2018
1003b	Seq. ID No. 2027	Seq. ID No. 2028
1006a	Seq. ID No. 2033	Seq. ID No. 2034
1013a	Seq. ID No. 2041	Seq. ID No. 2042
1017a	Seq. ID No. 2049	Seq. ID No. 2050
1017c	Seq. ID No. 2053	Seq. ID No. 2054
1036a	Seq. ID No. 2087	Seq. ID No. 2088
1036b	Seq. ID No. 2089	Seq. ID No. 2090
1044a	Seq. ID No. 2105	Seq. ID No. 2106
1047b	Seq. ID No. 2115	Seq. ID No. 2116

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1050a	Seq. ID No. 2121	Seq. ID No. 2122
1050d	Seq. ID No. 2127	Seq. ID No. 2128
1065b	Seq. ID No. 2151	Seq. ID No. 2152
1067	Seq. ID No. 2159	Seq. ID No. 2160
1077a	Seq. ID No. 2171	Seq. ID No. 2172
1077b	Seq. ID No. 2173	Seq. ID No. 2174
1077d	Seq. ID No. 2177	Seq. ID No. 2178
1081a	Seq. ID No. 2187	Seq. ID No. 2188
1111a	Seq. ID No. 2237	Seq. ID No. 2238
1111b	Seq. ID No. 2239	Seq. ID No. 2240
1125	Seq. ID No. 2245	Seq. ID No. 2246
1126b	Seq. ID No. 2249	Seq. ID No. 2250
1140a	Seq. ID No. 2271	Seq. ID No. 2272
1144a	Seq. ID No. 2283	Seq. ID No. 2284
1146a	Seq. ID No. 2289	Seq. ID No. 2290
1146b	Seq. ID No. 2291	Seq. ID No. 2292
1146c	Seq. ID No. 2293	Seq. ID No. 2294
1146d	Seq. ID No. 2295	Seq. ID No. 2296
1152a	Seq. ID No. 2303	Seq. ID No. 2304
1152b	Seq. ID No. 2305	Seq. ID No. 2306
1152c	Seq. ID No. 2307	Seq. ID No. 2308
1155a	Seq. ID No. 2317	Seq. ID No. 2318
1155b	Seq. ID No. 2319	Seq. ID No. 2320
1155c	Seq. ID No. 2321	Seq. ID No. 2322
1155d	Seq. ID No. 2323	Seq. ID No. 2324
1155e	Seq. ID No. 2325	Seq. ID No. 2326
1155f	Seq. ID No. 2327	Seq. ID No. 2328
1158b	Seq. ID No. 2333	Seq. ID No. 2334
1165	Seq. ID No. 2343	Seq. ID No. 2344

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1167a	Seq. ID No. 2347	Seq. ID No. 2348
1167b	Seq. ID No. 2349	Seq. ID No. 2350
1168	Seq. ID No. 2351	Seq. ID No. 2352
1169a	Seq. ID No. 2353	Seq. ID No. 2354
1169b	Seq. ID No. 2355	Seq. ID No. 2356
1169c	Seq. ID No. 2357	Seq. ID No. 2358
1172	Seq. ID No. 2365	Seq. ID No. 2366
1180d	Seq. ID No. 2389	Seq. ID No. 2390
1180e	Seq. ID No. 2391	Seq. ID No. 2392
1186a	Seq. ID No. 2407	Seq. ID No. 2408
1192a	Seq. ID No. 2419	Seq. ID No. 2420
1192b	Seq. ID No. 2421	Seq. ID No. 2422
1196b	Seq. ID No. 2427	Seq. ID No. 2428
1197	Seq. ID No. 2429	Seq. ID No. 2430
1199a	Seq. ID No. 2433	Seq. ID No. 2434
1207	Seq. ID No. 2449	Seq. ID No. 2450
1212	Seq. ID No. 2459	Seq. ID No. 2460
1224b	Seq. ID No. 2489	Seq. ID No. 2490
1228a	Seq. ID No. 2497	Seq. ID No. 2498
1229c	Seq. ID No. 2503	Seq. ID No. 2504
1231	Seq. ID No. 2507	Seq. ID No. 2508
1234a	Seq. ID No. 2515	Seq. ID No. 2516
1236a	Seq. ID No. 2523	Seq. ID No. 2524
1237	Seq. ID No. 2525	Seq. ID No. 2526
1241a	Seq. ID No. 2531	Seq. ID No. 2532
1241c	Seq. ID No. 2535	Seq. ID No. 2536
1243	Seq. ID No. 2537	Seq. ID No. 2538
1245a	Seq. ID No. 2541	Seq. ID No. 2542
1245b	Seq. ID No. 2543	Seq. ID No. 2544

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1245c	Seq. ID No. 2545	Seq. ID No. 2546
1250a	Seq. ID No. 2555	Seq. ID No. 2556
1250b	Seq. ID No. 2557	Seq. ID No. 2558
1253a	Seq. ID No. 2569	Seq. ID No. 2570
1253b	Seq. ID No. 2571	Seq. ID No. 2572
1258a	Seq. ID No. 2583	Seq. ID No. 2584
1260	Seq. ID No. 2591	Seq. ID No. 2592
1266a	Seq. ID No. 2597	Seq. ID No. 2598
1266b	Seq. ID No. 2599	Seq. ID No. 2600
1267a	Seq. ID No. 2601	Seq. ID No. 2602
1268b	Seq. ID No. 2607	Seq. ID No. 2608
1270	Seq. ID No. 2611	Seq. ID No. 2612
1275a	Seq. ID No. 2621	Seq. ID No. 2622
1278b	Seq. ID No. 2629	Seq. ID No. 2630
1288	Seq. ID No. 2651	Seq. ID No. 2652
1308a	Seq. ID No. 2679	Seq. ID No. 2680
1315	Seq. ID No. 2693	Seq. ID No. 2694
1319a	Seq. ID No. 2701	Seq. ID No. 2702
1319b	Seq. ID No. 2703	Seq. ID No. 2704
1320a	Seq. ID No. 2705	Seq. ID No. 2706
1320b	Seq. ID No. 2707	Seq. ID No. 2708
1334b	Seq. ID No. 2731	Seq. ID No. 2732
1335a	Seq. ID No. 2733	Seq. ID No. 2734
1365b	Seq. ID No. 2783	Seq. ID No. 2784
1366a	Seq. ID No. 2785	Seq. ID No. 2786
1381b	Seq. ID No. 2813	Seq. ID No. 2814
1382	Seq. ID No. 2815	Seq. ID No. 2816
1384c	Seq. ID No. 2823	Seq. ID No. 2824
1393a	Seq. ID No. 2835	Seq. ID No. 2836

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1393b	Seq. ID No. 2837	Seq. ID No. 2838
1393d	Seq. ID No. 2841	Seq. ID No. 2842
1399a	Seq. ID No. 2853	Seq. ID No. 2854
1411a	Seq. ID No. 2873	Seq. ID No. 2874
1411b	Seq. ID No. 2875	Seq. ID No. 2876
1412b	Seq. ID No. 2881	Seq. ID No. 2882
1426a	Seq. ID No. 2905	Seq. ID No. 2906
1438	Seq. ID No. 2935	Seq. ID No. 2936
1439a	Seq. ID No. 2937	Seq. ID No. 2938
1439b	Seq. ID No. 2939	Seq. ID No. 2940
1439c	Seq. ID No. 2941	Seq. ID No. 2942
1440a	Seq. ID No. 2947	Seq. ID No. 2948
1440b	Seq. ID No. 2949	Seq. ID No. 2950
1447a	Seq. ID No. 2969	Seq. ID No. 2970
1448	Seq. ID No. 2973	Seq. ID No. 2974
1449b	Seq. ID No. 2977	Seq. ID No. 2978
1452a	Seq. ID No. 2981	Seq. ID No. 2982
1454	Seq. ID No. 2987	Seq. ID No. 2988
1455b	Seq. ID No. 2991	Seq. ID No. 2992
1457a	Seq. ID No. 2995	Seq. ID No. 2996
1457b	Seq. ID No. 2997	Seq. ID No. 2998
1462b	Seq. ID No. 3005	Seq. ID No. 3006
1463a	Seq. ID No. 3007	Seq. ID No. 3008
1466a	Seq. ID No. 3013	Seq. ID No. 3014
1469a	Seq. ID No. 3023	Seq. ID No. 3024
1469b	Seq. ID No. 3025	Seq. ID No. 3026
1469c	Seq. ID No. 3027	Seq. ID No. 3028
1470a	Seq. ID No. 3029	Seq. ID No. 3030
1470b	Seq. ID No. 3031	Seq. ID No. 3032

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1475	Seq. ID No. 3043	Seq. ID No. 3044
1479c	Seq. ID No. 3055	Seq. ID No. 3056
1484a	Seq. ID No. 3063	Seq. ID No. 3064
1487	Seq. ID No. 3071	Seq. ID No. 3072
1488a	Seq. ID No. 3073	Seq. ID No. 3074
1488b	Seq. ID No. 3075	Seq. ID No. 3076
1488c	Seq. ID No. 3077	Seq. ID No. 3078
1507c	Seq. ID No. 3123	Seq. ID No. 3124
1517a	Seq. ID No. 3145	Seq. ID No. 3146
1520	Seq. ID No. 3155	Seq. ID No. 3156
1522	Seq. ID No. 3157	Seq. ID No. 3158
1530a	Seq. ID No. 3163	Seq. ID No. 3164
1543	Seq. ID No. 3183	Seq. ID No. 3184
1552	Seq. ID No. 3193	Seq. ID No. 3194
1554b	Seq. ID No. 3201	Seq. ID No. 3202
1557a	Seq. ID No. 3213	Seq. ID No. 3214
1557b	Seq. ID No. 3215	Seq. ID No. 3216
1557c	Seq. ID No. 3217	Seq. ID No. 3218
1559a	Seq. ID No. 3219	Seq. ID No. 3220
1572a	Seq. ID No. 3241	Seq. ID No. 3242
1572b	Seq. ID No. 3243	Seq. ID No. 3244
1572c	Seq. ID No. 3245	Seq. ID No. 3246
1572e	Seq. ID No. 3249	Seq. ID No. 3250
1577b	Seq. ID No. 3257	Seq. ID No. 3258
1580a	Seq. ID No. 3261	Seq. ID No. 3262
1582b	Seq. ID No. 3269	Seq. ID No. 3270
1585a	Seq. ID No. 3275	Seq. ID No. 3276
1594a	Seq. ID No. 3297	Seq. ID No. 3298
1606a	Seq. ID No. 3317	Seq. ID No. 3318

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1607b	Seq. ID No. 3323	Seq. ID No. 3324
1619	Seq. ID No. 3337	Seq. ID No. 3338
1621	Seq. ID No. 3339	Seq. ID No. 3340
1624	Seq. ID No. 3349	Seq. ID No. 3350
1625a	Seq. ID No. 3351	Seq. ID No. 3352
1625b	Seq. ID No. 3353	Seq. ID No. 3354
1626a	Seq. ID No. 3357	Seq. ID No. 3358
1626b	Seq. ID No. 3359	Seq. ID No. 3360
1634c	Seq. ID No. 3377	Seq. ID No. 3378
1646a	Seq. ID No. 3389	Seq. ID No. 3390
1646b	Seq. ID No. 3391	Seq. ID No. 3392
1646d	Seq. ID No. 3395	Seq. ID No. 3396
1649a	Seq. ID No. 3405	Seq. ID No. 3406
1659a	Seq. ID No. 3421	Seq. ID No. 3422
1659c	Seq. ID No. 3425	Seq. ID No. 3426
1673a	Seq. ID No. 3449	Seq. ID No. 3450
1673b	Seq. ID No. 3451	Seq. ID No. 3452
1673c	Seq. ID No. 3453	Seq. ID No. 3454
1673d	Seq. ID No. 3455	Seq. ID No. 3456
1673e	Seq. ID No. 3457	Seq. ID No. 3458
1675a	Seq. ID No. 3463	Seq. ID No. 3464
1683a	Seq. ID No. 3481	Seq. ID No. 3482
1688a	Seq. ID No. 3491	Seq. ID No. 3492
1688b	Seq. ID No. 3493	Seq. ID No. 3494
1690a	Seq. ID No. 3503	Seq. ID No. 3504
1690b	Seq. ID No. 3505	Seq. ID No. 3506
1699a	Seq. ID No. 3527	Seq. ID No. 3528
1735a	Seq. ID No. 3593	Seq. ID No. 3594
1735b	Seq. ID No. 3595	Seq. ID No. 3596

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1749a	Seq. ID No. 3621	Seq. ID No. 3622
1750a	Seq. ID No. 3625	Seq. ID No. 3626
1756b	Seq. ID No. 3635	Seq. ID No. 3636
1778b	Seq. ID No. 3679	Seq. ID No. 3680
1798a	Seq. ID No. 3723	Seq. ID No. 3724
1798c	Seq. ID No. 3727	Seq. ID No. 3728
1806b	Seq. ID No. 3745	Seq. ID No. 3746
1808a	Seq. ID No. 3753	Seq. ID No. 3754
1808b	Seq. ID No. 3755	Seq. ID No. 3756
1808c	Seq. ID No. 3757	Seq. ID No. 3758
1809a	Seq. ID No. 3761	Seq. ID No. 3762
1809b	Seq. ID No. 3763	Seq. ID No. 3764
1809c	Seq. ID No. 3765	Seq. ID No. 3766
1812b	Seq. ID No. 3783	Seq. ID No. 3784
1816a	Seq. ID No. 3793	Seq. ID No. 3794
1817a	Seq. ID No. 3799	Seq. ID No. 3800
1825	Seq. ID No. 3813	Seq. ID No. 3814
1838a	Seq. ID No. 3837	Seq. ID No. 3838
1838b	Seq. ID No. 3839	Seq. ID No. 3840
1842a	Seq. ID No. 3849	Seq. ID No. 3850
1842b	Seq. ID No. 3851	Seq. ID No. 3852
1842c	Seq. ID No. 3853	Seq. ID No. 3854
1845a	Seq. ID No. 3859	Seq. ID No. 3860
1845b	Seq. ID No. 3861	Seq. ID No. 3862
1845c	Seq. ID No. 3863	Seq. ID No. 3864
1848a	Seq. ID No. 3865	Seq. ID No. 3866
1854a	Seq. ID No. 3879	Seq. ID No. 3880
1857b	Seq. ID No. 3889	Seq. ID No. 3890
1857c	Seq. ID No. 3891	Seq. ID No. 3892



**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
1862a	Seq. ID No. 3903	Seq. ID No. 3904
1873c	Seq. ID No. 3925	Seq. ID No. 3926
1896a	Seq. ID No. 3963	Seq. ID No. 3964
1898a	Seq. ID No. 3973	Seq. ID No. 3974
1898b	Seq. ID No. 3975	Seq. ID No. 3976
1919a	Seq. ID No. 4005	Seq. ID No. 4006
1931a	Seq. ID No. 4025	Seq. ID No. 4026
1931b	Seq. ID No. 4027	Seq. ID No. 4028
1936	Seq. ID No. 4039	Seq. ID No. 4040
1937a	Seq. ID No. 4041	Seq. ID No. 4042
1937b	Seq. ID No. 4043	Seq. ID No. 4044
1937c	Seq. ID No. 4045	Seq. ID No. 4046
1937d	Seq. ID No. 4047	Seq. ID No. 4048
1941b	Seq. ID No. 4061	Seq. ID No. 4062
1946a	Seq. ID No. 4071	Seq. ID No. 4072
1946b	Seq. ID No. 4073	Seq. ID No. 4074
1950	Seq. ID No. 4079	Seq. ID No. 4080
1951a	Seq. ID No. 4081	Seq. ID No. 4082
1951b	Seq. ID No. 4083	Seq. ID No. 4084
1958a	Seq. ID No. 4101	Seq. ID No. 4102
1958b	Seq. ID No. 4103	Seq. ID No. 4104
1960c	Seq. ID No. 4111	Seq. ID No. 4112
1970b	Seq. ID No. 4133	Seq. ID No. 4134
1973	Seq. ID No. 4137	Seq. ID No. 4138
1976	Seq. ID No. 4139	Seq. ID No. 4140
1977c	Seq. ID No. 4145	Seq. ID No. 4146
1980a	Seq. ID No. 4151	Seq. ID No. 4152
2016a	Seq. ID No. 4221	Seq. ID No. 4222
2016b	Seq. ID No. 4223	Seq. ID No. 4224

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2016c	Seq. ID No. 4225	Seq. ID No. 4226
2016d	Seq. ID No. 4227	Seq. ID No. 4228
2016f	Seq. ID No. 4231	Seq. ID No. 4232
2023a	Seq. ID No. 4241	Seq. ID No. 4242
2024b	Seq. ID No. 4247	Seq. ID No. 4248
2025	Seq. ID No. 4253	Seq. ID No. 4254
2030a	Seq. ID No. 4257	Seq. ID No. 4258
2030c	Seq. ID No. 4261	Seq. ID No. 4262
2056	Seq. ID No. 4307	Seq. ID No. 4308
2059a	Seq. ID No. 4311	Seq. ID No. 4312
2059b	Seq. ID No. 4313	Seq. ID No. 4314
2074b	Seq. ID No. 4343	Seq. ID No. 4344
2092	Seq. ID No. 4379	Seq. ID No. 4380
2096a	Seq. ID No. 4385	Seq. ID No. 4386
2096c	Seq. ID No. 4389	Seq. ID No. 4390
2120b	Seq. ID No. 4439	Seq. ID No. 4440
2140a	Seq. ID No. 4469	Seq. ID No. 4470
2142a	Seq. ID No. 4473	Seq. ID No. 4474
2146	Seq. ID No. 4481	Seq. ID No. 4482
2147a	Seq. ID No. 4483	Seq. ID No. 4484
2147b	Seq. ID No. 4485	Seq. ID No. 4486
2150c	Seq. ID No. 4497	Seq. ID No. 4498
2159b	Seq. ID No. 4515	Seq. ID No. 4516
2165	Seq. ID No. 4533	Seq. ID No. 4534
2190a	Seq. ID No. 4587	Seq. ID No. 4588
2219a	Seq. ID No. 4639	Seq. ID No. 4640
2219c	Seq. ID No. 4643	Seq. ID No. 4644
2236a	Seq. ID No. 4681	Seq. ID No. 4682
2249	Seq. ID No. 4705	Seq. ID No. 4706

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2253a	Seq. ID No. 4707	Seq. ID No. 4708
2253b	Seq. ID No. 4709	Seq. ID No. 4710
2253c	Seq. ID No. 4711	Seq. ID No. 4712
2255a	Seq. ID No. 4715	Seq. ID No. 4716
2255b	Seq. ID No. 4717	Seq. ID No. 4718
2264b	Seq. ID No. 4737	Seq. ID No. 4738
2276a	Seq. ID No. 4759	Seq. ID No. 4760
2300	Seq. ID No. 4813	Seq. ID No. 4814
2308	Seq. ID No. 4827	Seq. ID No. 4828
2329a	Seq. ID No. 4869	Seq. ID No. 4870
2329b	Seq. ID No. 4871	Seq. ID No. 4872
2329c	Seq. ID No. 4873	Seq. ID No. 4874
2329d	Seq. ID No. 4875	Seq. ID No. 4876
2357	Seq. ID No. 4919	Seq. ID No. 4920
2363b	Seq. ID No. 4931	Seq. ID No. 4932
2371a	Seq. ID No. 4949	Seq. ID No. 4950
2372	Seq. ID No. 4951	Seq. ID No. 4952
2390	Seq. ID No. 4987	Seq. ID No. 4988
2412	Seq. ID No. 5031	Seq. ID No. 5032
2423a	Seq. ID No. 5061	Seq. ID No. 5062
2434	Seq. ID No. 5085	Seq. ID No. 5086
2445	Seq. ID No. 5103	Seq. ID No. 5104
2456c	Seq. ID No. 5123	Seq. ID No. 5124
2458a	Seq. ID No. 5129	Seq. ID No. 5130
2458b	Seq. ID No. 5131	Seq. ID No. 5132
2458d	Seq. ID No. 5135	Seq. ID No. 5136
2458e	Seq. ID No. 5137	Seq. ID No. 5138
2458g	Seq. ID No. 5141	Seq. ID No. 5142
2469b	Seq. ID No. 5165	Seq. ID No. 5166

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2474b	Seq. ID No. 5175	Seq. ID No. 5176
2484b	Seq. ID No. 5199	Seq. ID No. 5200
2490	Seq. ID No. 5205	Seq. ID No. 5206
2492a	Seq. ID No. 5207	Seq. ID No. 5208
2495a	Seq. ID No. 5213	Seq. ID No. 5214
2497b	Seq. ID No. 5219	Seq. ID No. 5220
2500a	Seq. ID No. 5223	Seq. ID No. 5224
2518a	Seq. ID No. 5267	Seq. ID No. 5268
2521	Seq. ID No. 5281	Seq. ID No. 5282
2567a	Seq. ID No. 5385	Seq. ID No. 5386
2567b	Seq. ID No. 5387	Seq. ID No. 5388
2587a	Seq. ID No. 5413	Seq. ID No. 5414
2587b	Seq. ID No. 5415	Seq. ID No. 5416
2596	Seq. ID No. 5433	Seq. ID No. 5434
2610	Seq. ID No. 5453	Seq. ID No. 5454
2616a	Seq. ID No. 5459	Seq. ID No. 5460
2616b	Seq. ID No. 5461	Seq. ID No. 5462
2616c	Seq. ID No. 5463	Seq. ID No. 5464
2616d	Seq. ID No. 5465	Seq. ID No. 5466
2623b	Seq. ID No. 5491	Seq. ID No. 5492
2625a	Seq. ID No. 5497	Seq. ID No. 5498
2628	Seq. ID No. 5509	Seq. ID No. 5510
2629b	Seq. ID No. 5513	Seq. ID No. 5514
2633d	Seq. ID No. 5525	Seq. ID No. 5526
2637b	Seq. ID No. 5531	Seq. ID No. 5532
2660	Seq. ID No. 5569	Seq. ID No. 5570
2669a	Seq. ID No. 5587	Seq. ID No. 5588
2673	Seq. ID No. 5595	Seq. ID No. 5596
2674a	Seq. ID No. 5597	Seq. ID No. 5598

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2679a	Seq. ID No. 5609	Seq. ID No. 5610
2679b	Seq. ID No. 5611	Seq. ID No. 5612
2680c	Seq. ID No. 5621	Seq. ID No. 5622
2683a	Seq. ID No. 5623	Seq. ID No. 5624
2688a	Seq. ID No. 5633	Seq. ID No. 5634
2688c	Seq. ID No. 5637	Seq. ID No. 5638
2690a	Seq. ID No. 5643	Seq. ID No. 5644
2692b	Seq. ID No. 5649	Seq. ID No. 5650
2696a	Seq. ID No. 5659	Seq. ID No. 5660
2718b	Seq. ID No. 5683	Seq. ID No. 5684
2718c	Seq. ID No. 5685	Seq. ID No. 5686
2723	Seq. ID No. 5699	Seq. ID No. 5700
2725b	Seq. ID No. 5705	Seq. ID No. 5706
2728a	Seq. ID No. 5709	Seq. ID No. 5710
2738a	Seq. ID No. 5729	Seq. ID No. 5730
2738c	Seq. ID No. 5733	Seq. ID No. 5734
2749a	Seq. ID No. 5763	Seq. ID No. 5764
2749b	Seq. ID No. 5765	Seq. ID No. 5766
2749c	Seq. ID No. 5767	Seq. ID No. 5768
2749e	Seq. ID No. 5771	Seq. ID No. 5772
2757b	Seq. ID No. 5783	Seq. ID No. 5784
2758d	Seq. ID No. 5791	Seq. ID No. 5792
2760a	Seq. ID No. 5797	Seq. ID No. 5798
2796a	Seq. ID No. 5885	Seq. ID No. 5886
2799a	Seq. ID No. 5889	Seq. ID No. 5890
2801a	Seq. ID No. 5893	Seq. ID No. 5894
2801b	Seq. ID No. 5895	Seq. ID No. 5896
2805a	Seq. ID No. 5899	Seq. ID No. 5900
2805b	Seq. ID No. 5901	Seq. ID No. 5902

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2810a	Seq. ID No. 5905	Seq. ID No. 5906
2810c	Seq. ID No. 5909	Seq. ID No. 5910
2818a	Seq. ID No. 5921	Seq. ID No. 5922
2818b	Seq. ID No. 5923	Seq. ID No. 5924
2818d	Seq. ID No. 5927	Seq. ID No. 5928
2822a	Seq. ID No. 5939	Seq. ID No. 5940
2869c	Seq. ID No. 6027	Seq. ID No. 6028
2881	Seq. ID No. 6043	Seq. ID No. 6044
2883a	Seq. ID No. 6047	Seq. ID No. 6048
2887a	Seq. ID No. 6059	Seq. ID No. 6060
2891a	Seq. ID No. 6067	Seq. ID No. 6068
2900b	Seq. ID No. 6089	Seq. ID No. 6090
2901a	Seq. ID No. 6091	Seq. ID No. 6092
2909b	Seq. ID No. 6107	Seq. ID No. 6108
2909d	Seq. ID No. 6111	Seq. ID No. 6112
2913b	Seq. ID No. 6117	Seq. ID No. 6118
2931a	Seq. ID No. 6161	Seq. ID No. 6162
2931b	Seq. ID No. 6163	Seq. ID No. 6164
2931c	Seq. ID No. 6165	Seq. ID No. 6166
2933b	Seq. ID No. 6169	Seq. ID No. 6170
2941a	Seq. ID No. 6183	Seq. ID No. 6184
2941b	Seq. ID No. 6185	Seq. ID No. 6186
2943a	Seq. ID No. 6189	Seq. ID No. 6190
2943b	Seq. ID No. 6191	Seq. ID No. 6192
2944b	Seq. ID No. 6197	Seq. ID No. 6198
2948a	Seq. ID No. 6203	Seq. ID No. 6204
2948b	Seq. ID No. 6205	Seq. ID No. 6206
2948d	Seq. ID No. 6209	Seq. ID No. 6210
2955a	Seq. ID No. 6221	Seq. ID No. 6222

**TABLE 21: SIGNAL SEARCH ORFs**

<b>ORF Number</b>	<b>DNA SEQ ID Number</b>	<b>Protein SEQ ID Number</b>
2955b	Seq. ID No. 6223	Seq. ID No. 6224
2955c	Seq. ID No. 6225	Seq. ID No. 6226
2955d	Seq. ID No. 6227	Seq. ID No. 6228
2955e	Seq. ID No. 6229	Seq. ID No. 6230
2957	Seq. ID No. 6235	Seq. ID No. 6236
2958a	Seq. ID No. 6237	Seq. ID No. 6238
2959	Seq. ID No. 6243	Seq. ID No. 6244
2960a	Seq. ID No. 6245	Seq. ID No. 6246
2962b	Seq. ID No. 6249	Seq. ID No. 6250
2965a	Seq. ID No. 6253	Seq. ID No. 6254
2969	Seq. ID No. 6263	Seq. ID No. 6264
2970a	Seq. ID No. 6265	Seq. ID No. 6266
2974a	Seq. ID No. 6273	Seq. ID No. 6274
2974b	Seq. ID No. 6275	Seq. ID No. 6276
2978b	Seq. ID No. 6285	Seq. ID No. 6286
2980a	Seq. ID No. 6289	Seq. ID No. 6290
2986a	Seq. ID No. 6301	Seq. ID No. 6302
2986b	Seq. ID No. 6303	Seq. ID No. 6304
3016a	Seq. ID No. 6363	Seq. ID No. 6364
3021	Seq. ID No. 6377	Seq. ID No. 6378
3023	Seq. ID No. 6381	Seq. ID No. 6382
3024a	Seq. ID No. 6383	Seq. ID No. 6384
3037a	Seq. ID No. 6415	Seq. ID No. 6416
3042b	Seq. ID No. 6427	Seq. ID No. 6428
3043b	Seq. ID No. 6431	Seq. ID No. 6432
3064b	Seq. ID No. 6473	Seq. ID No. 6474
3076	Seq. ID No. 6497	Seq. ID No. 6498
3107a	Seq. ID No. 6571	Seq. ID No. 6572
3110a	Seq. ID No. 6581	Seq. ID No. 6582

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3119a	Seq. ID No. 6593	Seq. ID No. 6594
3119d	Seq. ID No. 6599	Seq. ID No. 6600
3140	Seq. ID No. 6631	Seq. ID No. 6632
3145c	Seq. ID No. 6639	Seq. ID No. 6640

**B. *ALLOIOCOCCUS OTITIDIS* ORF POLYNUCLEOTIDES ENCODING SURFACE EXPOSED POLYPEPTIDES**

5 Isolated and purified *Alloiococcus otitidis* ORF polynucleotides of the present invention are contemplated for use in the production of *Alloiococcus otitidis* polypeptides. More specifically, in certain embodiments, the ORFs encode *Alloiococcus otitidis* surface exposed polypeptides, particularly antigenic polypeptides. Thus, in one aspect, the present invention provides isolated and purified polynucleotides (ORFs) that encode

10 *Alloiococcus otitidis* surface exposed polypeptides. In particular embodiments, a polynucleotide of the present invention is a DNA molecule, wherein the DNA may be genomic DNA, plasmid DNA or cDNA. In a preferred embodiment, a polynucleotide of the present invention is a recombinant polynucleotide, which encodes an *Alloiococcus*

15 *otitidis* polypeptide comprising an amino acid sequence that has at least 70% identity to an amino acid sequence of one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650 or a fragment thereof. In another embodiment, an isolated and purified ORF polynucleotide comprises a nucleotide sequence that has at least 70% identity to one of the ORF polynucleotide nucleotide sequences of odd

20 numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, a degenerate variant thereof, or a complement thereof. In yet another embodiment, an ORF polynucleotide of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649 is comprised in a plasmid vector and expressed in a host cell. In a preferred embodiment, the host cell is a prokaryotic host cell.

25 As used herein, the term "polynucleotide" means a sequence of nucleotides connected by phosphodiester linkages. It is well understood that in all prokaryotes studied to date, including *Alloiococcus otitidis*, most or all cellular genetic material is



contained within a single circular chromosome. The single circular chromosome is usually comprised of double stranded DNA, wherein the ORFs encoding polypeptides may be represented on either strand of the bacterial chromosome in a head to tail or a head to head orientation. Polynucleotides are presented herein from the 5' to the 3' direction. A polynucleotide of the present invention can comprise from about 10 nucleotides to about several hundred thousand nucleotides. Preferably, a polynucleotide comprises from about 10 to about 3,000 nucleotides. Preferred lengths of particular polynucleotide are set forth hereinafter.

A polynucleotide of the present invention can be a deoxyribonucleic acid (DNA) molecule, a ribonucleic acid (RNA) molecule, or analogs of the DNA or RNA generated using nucleotide analogs. The nucleic acid molecule can be single-stranded or double-stranded, but preferably is double-stranded DNA. Where a polynucleotide is a DNA molecule, that molecule can be a gene, a cDNA molecule or a genomic DNA molecule. Nucleotide bases are indicated herein by a single letter code: adenine (A), guanine (G), thymine (T) and cytosine (C).

"Isolated" means altered "by the hand of man" from the natural state. An "isolated" composition or substance is one that has been changed or removed from its original environment, or both. For example, a polynucleotide or a polypeptide naturally present in a living animal is not "isolated," but the same polynucleotide or polypeptide separated from the coexisting materials of its natural state is "isolated," as the term is employed herein.

Preferably, an "isolated" polynucleotide is free of sequences, which naturally flank the nucleic acid (*i.e.*, sequences located at the 5' and 3' ends of the nucleic acid) in the genomic DNA of the organism from which the nucleic acid is derived. For example, in various embodiments, the isolated *Alloiococcus otitidis* nucleic acid molecule can contain less than about 5 kb, 4 kb, 3 kb, 2 kb, 1 kb, 0.5 kb or 0.1 kb of nucleotide sequences which naturally flank the nucleic acid molecule in genomic DNA of the cell from which the nucleic acid is derived (*e.g.*, neuronal or placenta). However, the *Alloiococcus otitidis* nucleic acid molecule can be fused to heterologous protein encoding or regulatory sequences and still be considered isolated.

ORF polynucleotides of the present invention are obtained using standard cloning and screening techniques from a cDNA library derived from mRNA. Polynucleotides of the invention are also obtained from natural sources such as genomic DNA libraries

(e.g., an *Alloiococcus otitidis* library) or are synthesized using well known and commercially available techniques. As contemplated in the present invention, ORF polynucleotides are obtained using *Alloiococcus otitidis* chromosomal DNA as the template.

5           The invention further encompasses nucleic acid molecules that differ from the nucleotide sequences shown in one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649 (and fragments thereof) due to degeneracy of the genetic code, and thus encode the same *Alloiococcus otitidis* polypeptide as that encoded by the nucleotide sequence shown in one of the odd numbered sequences set  
10       forth in SEQ ID NO:1 through SEQ ID NO: 6649.

          Orthologs and allelic variants of the *Alloiococcus otitidis* polynucleotides are readily identified using methods well known in the art. Allelic variants and orthologs of the polynucleotides comprise a nucleotide sequence that is typically at least about 70-75%, more typically at least about 80-85%, and most typically at least about 90-95% or  
15       more homologous to a nucleotide sequence shown in one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649, or a fragment of these nucleotide sequences. Such nucleic acid molecules are readily identified as being able to hybridize, preferably under stringent conditions, to a nucleotide sequence shown in one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO:  
20       6649, or a fragment of these nucleotide sequences.

          Moreover, the polynucleotides of the invention also comprise only a fragment of the coding region of an *Alloiococcus otitidis* polynucleotide or gene, such as a fragment of and one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649. Preferably, such fragments encode polypeptides, which are immunogenic  
25       fragments.

          When the ORF polynucleotides of the invention are used for the recombinant production of *Alloiococcus otitidis* polypeptides of the present invention, the polynucleotide may include the coding sequence for the mature polypeptide, by itself, or the coding sequence for the mature polypeptide in reading frame with other coding  
30       sequences, such as those encoding a leader or secretory sequence, a pre-, or pro- or prepro- protein sequence, or other fusion peptide portions. For example, a marker sequence, which facilitates purification of the fused polypeptide, can be linked to the coding sequence (see Gentz *et al.*, 1989, incorporated herein by reference). Thus,

contemplated in the present invention is the preparation of polynucleotides encoding fusion polypeptides permitting His-tag purification of expression products. The polynucleotide may also contain non-coding 5' and 3' sequences, such as transcribed, non-translated sequences, splicing and polyadenylation signals.

5           Thus, a polynucleotide encoding a polypeptide of the present invention, including homologs and orthologs from species other than *Alloiococcus otitidis*, is obtained by a process which comprises the steps of screening an appropriate library under stringent hybridization conditions (discussed below) with a labeled probe having the sequence of one of the odd numbered sequences set forth in one of SEQ ID NO:1 through SEQ ID  
10 NO: 6649 or a fragment thereof; and isolating full-length cDNA and genomic clones containing the polynucleotide sequence. Such hybridization techniques are well known to the skilled artisan. The skilled artisan will appreciate that, in many cases, an isolated cDNA sequence will be incomplete, in that the region coding for the polypeptide is cut short at the 5' end of the cDNA. This is a consequence of reverse transcriptase, an  
15 enzyme with inherently low "processivity" (a measure of the ability of the enzyme to remain attached to the template during the polymerization reaction), failing to complete a DNA copy of the mRNA template during 1st strand cDNA synthesis.

          Thus, in certain embodiments, the polynucleotide sequence information provided by the present invention allows for the preparation of relatively short DNA (or RNA)  
20 oligonucleotide sequences having the ability to specifically hybridize to gene sequences of the selected polynucleotides disclosed herein. The term "oligonucleotide" as used herein is defined as a molecule comprised of two or more deoxyribonucleotides or ribonucleotides, usually more than three (3), and typically more than ten (10) and up to one hundred (100) or more (although preferably between twenty and thirty). The exact  
25 size will depend on many factors, which in turn depends on the ultimate function or use of the oligonucleotide. Thus, in particular embodiments of the invention, nucleic acid probes of an appropriate length are prepared based on a consideration of a selected nucleotide sequence, *e.g.*, a sequence such as that shown in one of odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649. The ability of such  
30 nucleic acid probes to specifically hybridize to a polynucleotide encoding an *Alloiococcus otitidis* polypeptide lends them particular utility in a variety of embodiments. Most importantly, the probes are used in a variety of assays for detecting the presence of complementary sequences in a given sample.

In certain embodiments, it is advantageous to use oligonucleotide primers. These primers may be generated in any manner, including chemical synthesis, DNA replication, reverse transcription, or a combination thereof. The sequence of such primers is designed using a polynucleotide of the present invention for use in detecting, amplifying or mutating a defined segment of an ORF polynucleotide that encodes an *Alloiococcus otitidis* polypeptide from prokaryotic cells using polymerase chain reaction (PCR) technology.

In certain embodiments, it is advantageous to employ a polynucleotide of the present invention in combination with an appropriate label for detecting hybrid formation. A wide variety of appropriate labels are known in the art, including radioactive, enzymatic or other ligands, such as avidin/biotin, which are capable of giving a detectable signal.

Polynucleotides which are identical or sufficiently identical to a nucleotide sequence contained in one of odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649, or a fragment thereof, may be used as hybridization probes for cDNA and genomic DNA or as primers for a nucleic acid amplification (PCR) reaction, to isolate full-length cDNAs and genomic clones encoding polypeptides of the present invention and to isolate cDNA and genomic clones of other genes (including genes encoding homologs and orthologs from species other than *Alloiococcus otitidis*) that have a high sequence similarity to polynucleotide sequences set forth in one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO:6649, or a fragment thereof. Typically these nucleotide sequences are from at least 70% identical to at least about 70% identical to that of the reference polynucleotide sequence. The probes or primers will generally comprise at least 15 nucleotides, preferably, at least 30 nucleotides and may have at least 50 nucleotides. Particularly preferred probes will have between 30 and 50 nucleotides.

There are several methods available and well known to those skilled in the art to obtain full-length cDNAs, or extend short cDNAs, for example those based on the method of Rapid Amplification of cDNA ends (RACE) (see, Frohman *et al.*, 1988). Recent modifications of the technique, exemplified by the Marathon™ technology (BD Biosciences Clontech, Palo Alto, CA) for example, have significantly simplified the search for longer cDNAs. In the Marathon™ technology, cDNAs have been prepared from mRNA extracted from a chosen tissue and an "adaptor" sequence ligated onto each end. Nucleic acid amplification (PCR) is then carried out to amplify the "missing" 5' end

of the cDNA using a combination of gene specific and adaptor specific oligonucleotide primers. The PCR reaction is then repeated using "nested" primers, that is, primers designed to anneal within the amplified product (typically an adaptor specific primer that anneals further 3' in the adaptor sequence and a gene specific primer that anneals further 5' in the known gene sequence). The products of this reaction are then analyzed by DNA sequencing and a full-length cDNA constructed either by joining the product directly to the existing cDNA to give a complete sequence, or carrying out a separate full-length PCR using the new sequence information for the design of the 5' primer.

To provide certain of the advantages in accordance with the present invention, a preferred nucleic acid sequence employed for hybridization studies or assays includes probe molecules that are complementary to at least a 10 to about 70 long nucleotide stretch of a polynucleotide that encodes an *Alloiococcus otitidis* polypeptide, such as that shown in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650. A size of at least 10 nucleotides in length helps to ensure that the fragment will be of sufficient length to form a duplex molecule that is both stable and selective. Molecules having complementary sequences over stretches greater than 10 bases in length are generally preferred in order to increase stability and selectivity of the hybrid, and thereby improve the quality and degree of specific hybrid molecules obtained. It is generally preferred to design nucleic acid molecules with gene-complementary stretches of 25 to 40 nucleotides, 55 to 70 nucleotides, or even longer where desired. For example, such fragments are readily prepared by directly synthesizing the fragment by chemical means, by application of nucleic acid reproduction technology, such as the PCR technology (U.S. Patent 4,683,202, incorporated herein by reference), or by excising selected DNA fragments from recombinant plasmids containing appropriate inserts and suitable restriction enzyme sites.

In another aspect, the present invention contemplates an isolated and purified polynucleotide comprising a nucleotide sequence that is identical or complementary to a segment of at least 10 contiguous bases of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, wherein the polynucleotide hybridizes to a polynucleotide that encodes an *Alloiococcus otitidis* polypeptide. Preferably, the isolated and purified polynucleotide comprises a base sequence that is identical or complementary to a segment of at least 25 to 70 contiguous bases of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649. For

example, the polynucleotide of the invention can comprise a segment of bases identical or complementary to from 40 to 55 contiguous bases of the disclosed nucleotide sequences.

Accordingly, a polynucleotide probe molecule of the invention is used for its ability to selectively form duplex molecules with complementary stretches of the gene. Depending on the application envisioned, one will desire to employ varying conditions of hybridization stringency to achieve varying degree of selectivity of the probe toward the target sequence (see Table 22 below). For applications requiring a high degree of selectivity, one will typically desire to employ relatively stringent conditions to form the hybrids. For some applications, for example, where one desires to prepare mutants employing a mutant primer strand hybridized to an underlying template or where one seeks to isolate an *Alloiococcus otitidis* homologous polypeptide coding sequence from other cells, functional equivalents, or the like, less stringent hybridization conditions are typically needed to allow formation of the heteroduplex (see Table 22). Cross-hybridizing species can thereby be readily identified as positively hybridizing signals with respect to control hybridizations. In any case, it is generally appreciated that conditions can be rendered more stringent by the addition of increasing amounts of formamide, which serves to destabilize the hybrid duplex in the same manner as increased temperature. Thus, hybridization conditions can be readily manipulated, and thus will generally be a method of choice depending on the desired results.

The present invention also includes polynucleotides capable of hybridizing under reduced stringency conditions, more preferably stringent conditions, and most preferably highly stringent conditions, to polynucleotides described herein. Examples of stringency conditions are shown in the Table 22 below: highly stringent conditions are those that are at least as stringent as, for example, conditions A-F; stringent conditions are at least as stringent as, for example, conditions G-L; and reduced stringency conditions are at least as stringent as, for example, conditions M-R.

**TABLE 22**  
**HYBRIDIZATION STRINGENCY CONDITIONS**

Stringency Condition	Polynucleotide Hybrid	Hybrid Length (bp) <sup>1</sup>	Hybridization Temperature and Buffer <sup>H</sup>	Wash Temperature and Buffer <sup>H</sup>
A	DNA:DNA	> 50	65°C; 1xSSC -or- 42 °C; 1xSSC,	65 °C; 0.3xSSC

50% formamide				
B	DNA:DNA	< 50	T <sub>B</sub> ; 1xSSC	T <sub>B</sub> ; 1xSSC
C	DNA:RNA	> 50	67 °C; 1xSSC - or- 45 °C; 1xSSC, 50% formamide	67 °C; 0.3xSSC
D	DNA:RNA	< 50	T <sub>D</sub> ; 1xSSC	T <sub>D</sub> ; 1xSSC
E	RNA:RNA	> 50	70 °C; 1xSSC - or- 50 °C; 1xSSC, 50% formamide	70 °C; 0.3xSSC
F	RNA:RNA	< 50	T <sub>F</sub> ; 1xSSC	T <sub>F</sub> ; 1xSSC
G	DNA:DNA	> 50	65 °C; 4xSSC - or- 42 °C; 4xSSC, 50% formamide	65 °C; 1xSSC
H	DNA:DNA	< 50	T <sub>H</sub> ; 4xSSC	T <sub>H</sub> ; 4xSSC

TABLE 22

## HYBRIDIZATION STRINGENCY CONDITIONS

Stringency Condition	Polynucleotide Hybrid	Hybrid Length (bp) <sup>1</sup>	Hybridization Temperature and Buffer <sup>H</sup>	Wash Temperature and Buffer <sup>H</sup>
I	DNA:RNA	> 50	67 °C; 4xSSC - or- 45 °C; 4xSSC, 50% formamide	67 °C; 1xSSC
J	DNA:RNA	< 50	T <sub>J</sub> ; 4xSSC	T <sub>J</sub> ; 4xSSC
K	RNA:RNA	> 50	70 °C; 4xSSC - or- 50 °C; 4xSSC, 50% formamide	67 °C; 1xSSC
L	RNA:RNA	< 50	T <sub>L</sub> ; 2xSSC	T <sub>L</sub> ; 2xSSC
M	DNA:DNA	> 50	50 °C; 4xSSC - or- 40 °C; 6xSSC, 50% formamide	50 °C; 2xSSC
N	DNA:DNA	< 50	T <sub>N</sub> ; 6xSSC	T <sub>N</sub> ; 6xSSC
O	DNA:RNA	> 50	55 °C; 4xSSC - or- 42 °C; 6xSSC, 50% formamide	55 °C; 2xSSC
P	DNA:RNA	< 50	T <sub>P</sub> ; 6xSSC	T <sub>P</sub> ; 6xSSC
Q	RNA:RNA	> 50	60 °C; 4xSSC - or- 45 °C; 6xSSC, 50% formamide	60 °C; 2xSSC
R	RNA:RNA	< 50	T <sub>R</sub> ; 4xSSC	T <sub>R</sub> ; 4xSSC

(bp)<sup>1</sup>: The hybrid length is that anticipated for the hybridized region(s) of the hybridizing polynucleotides. When hybridizing a polynucleotide to a target  
5 polynucleotide of unknown sequence, the hybrid length is assumed to be that of the hybridizing polynucleotide. When polynucleotides of known sequence are hybridized,



the hybrid length is determined by aligning the sequences of the polynucleotides and identifying the region or regions of optimal sequence complementarity.

Buffer<sup>H</sup>: SSPE (1xSSPE is 0.15M NaCl, 10mM NaH<sub>2</sub>PO<sub>4</sub>, and 1.25mM EDTA, pH 7.4), can be substituted for SSC (1xSSC is 0.15M NaCl and 15mM sodium citrate) in the hybridization and wash buffers; washes are performed for 15 minutes after hybridization is complete.

T<sub>B</sub> through T<sub>R</sub>: The hybridization temperature for hybrids anticipated to be less than 50 base pairs in length should be 5-10 °C less than the melting temperature (T<sub>m</sub>) of the hybrid, where T<sub>m</sub> is determined according to the following equations. For hybrids less than 18 base pairs in length, T<sub>m</sub>( °C) = 2(# of A + T bases) + 4(# of G + C bases). For hybrids between 18 and 49 base pairs in length, T<sub>m</sub>( °C) = 81.5 + 16.6(log<sub>10</sub>[Na<sup>+</sup>]) + 0.41(%G+C) - (600/N), where N is the number of bases in the hybrid, and [Na<sup>+</sup>] is the concentration of sodium ions in the hybridization buffer ([Na<sup>+</sup>] for 1xSSC = 0.165 M).

Additional examples of stringency conditions for polynucleotide hybridization are provided in Sambrook *et al.*, 1989, Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, chapters 9 and 11, and Ausubel *et al.*, 1995, Current Protocols in Molecular Biology, Eds., John Wiley & Sons, Inc., sections 2.10 and 6.3-6.4, incorporated herein by reference.

In addition to the nucleic acid molecules encoding *Alloiococcus otitidis* polypeptides described above, another aspect of the invention pertains to isolated nucleic acid molecules that are antisense thereto. An "antisense" nucleic acid comprises a nucleotide sequence that is complementary to a "sense" nucleic acid encoding a protein, *e.g.*, complementary to the coding strand of a double-stranded cDNA molecule or complementary to an mRNA sequence. Accordingly, an antisense nucleic acid can hydrogen bond to a sense nucleic acid. The antisense nucleic acid can be complementary to an entire *Alloiococcus otitidis* coding strand, or to only a fragment thereof. In one embodiment, an antisense nucleic acid molecule is antisense to a "coding region" of the coding strand of a nucleotide sequence encoding an *Alloiococcus otitidis* polypeptide.

The term "coding region" refers to the region of the nucleotide sequence comprising codons which are translated into amino acid residues, *e.g.*, the entire coding region of each of odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649. In another embodiment, the antisense nucleic acid molecule is antisense to a

“noncoding region” of the coding strand of a nucleotide sequence encoding an *Alloiococcus otitidis* polypeptide. The term “noncoding region” refers to 5' and 3' sequences that flank the coding region that are not translated into amino acids (*i.e.*, also referred to as 5' and 3' untranslated regions).

5           Given the coding strand sequence encoding the *Alloiococcus otitidis* polypeptides disclosed herein antisense nucleic acids of the invention can be designed according to the rules of Watson and Crick base pairing. The antisense nucleic acid molecule can be complementary to the entire coding region of *Alloiococcus otitidis* mRNA, but more preferably is an oligonucleotide which is antisense to only a fragment of the coding or  
10 noncoding region of *Alloiococcus otitidis* mRNA. For example, the antisense oligonucleotide can be complementary to the region surrounding the translation start site of *Alloiococcus otitidis* mRNA.

          An antisense oligonucleotide can be, for example, about 5, 10, 15, 20, 25, 30, 35, 40, 45 or 50 nucleotides in length. An antisense nucleic acid of the invention can be  
15 constructed using chemical synthesis and enzymatic ligation reactions using procedures known in the art. For example, an antisense nucleic acid (*e.g.*, an antisense oligonucleotide) can be chemically synthesized using naturally occurring nucleotides or variously modified nucleotides designed to increase the biological stability of the molecules or to increase the physical stability of the duplex formed between the  
20 antisense and sense nucleic acids, *e.g.*, phosphorothioate derivatives and acridine substituted nucleotides can be used. Examples of modified nucleotides which can be used to generate the antisense nucleic acid include 5-fluorouracil, 5-bromouracil, 5-chlorouracil, 5-iodouracil, hypoxanthine, xanthine, 4-acetylcytosine, 5-(carboxyhydroxymethyl) uracil, 5-carboxymethylaminomethyl-2-thiouridine, 5-  
25 carboxymethylaminomethyluracil, dihydrouracil, beta-D-galactosylqueosine, inosine, N6-isopentenyladenine, 1-methylguanine, 1-methylinosine, 2,2-dimethylguanine, 2-methyladenine, 2-methylguanine, 3-methylcytosine, 5-methylcytosine, N6-adenine, 7-methylguanine, 5-methylaminomethyluracil, 5-methoxyaminomethyl-2-thiouracil, beta-D-mannosylqueosine, 5'-methoxycarboxymethyluracil, 5-methoxyuracil, 2-methylthio-N6-  
30 isopentenyladenine, uracil-5-oxyacetic acid (v), wybutoxosine, pseudouracil, queosine, 2-thiocytosine, 5-methyl-2-thiouracil, 2-thiouracil, 4-thiouracil, 5-methyluracil, uracil-5-oxyacetic acid methylester, uracil-5-oxyacetic acid (v), 5-methyl-2-thiouracil, 3-(3-amino-3-N-2-carboxypropyl) uracil, (acp3)w, and 2,6-diaminopurine.

Alternatively, the antisense nucleic acid can be produced biologically using an expression vector into which a nucleic acid has been subcloned in an antisense orientation (*i.e.*, RNA transcribed from the inserted nucleic acid will be of an antisense orientation to a target nucleic acid of interest, described further in the following subsection).

The antisense nucleic acid molecules of the invention are typically administered to a subject or generated *in situ* such that they hybridize with or bind to cellular mRNA and/or genomic DNA encoding an *Alloiococcus otitidis* polypeptide to thereby inhibit expression of the polypeptide, *e.g.*, by inhibiting transcription and/or translation. The hybridization can be by conventional nucleotide complementarity to form a stable duplex, or, for example, in the case of an antisense nucleic acid molecule which binds to DNA duplexes, through specific interactions in the major groove of the double helix. An example of a route of administration of an antisense nucleic acid molecule of the invention includes direct injection at a tissue site. Alternatively, an antisense nucleic acid molecule can be modified to target selected cells and then administered systemically. For example, for systemic administration, an antisense molecule can be modified such that it specifically binds to a receptor or an antigen expressed on a selected cell surface, *e.g.*, by linking the antisense nucleic acid molecule to a peptide or an antibody which binds to a cell surface receptor or antigen. The antisense nucleic acid molecule can also be delivered to cells using the vectors described herein.

In yet another embodiment, the antisense nucleic acid molecule of the invention is an  $\alpha$ -anomeric nucleic acid molecule. An  $\alpha$ -anomeric nucleic acid molecule forms specific double-stranded hybrids with complementary RNA in which, contrary to the usual  $\gamma$ -units, the strands run parallel to each other (Gaultier *et al.*, 1987). The antisense nucleic acid molecule can also comprise a 2'-o-methylribonucleotide (Inoue *et al.*, 1987a) or a chimeric RNA-DNA analogue (Inoue *et al.*, 1987b).

In still another embodiment, an antisense nucleic acid of the invention is a ribozyme. Ribozymes are catalytic RNA molecules with ribonuclease activity that are capable of cleaving a single-stranded nucleic acid, such as a mRNA, to which they have a complementary region. Thus, ribozymes (*e.g.*, hammerhead ribozymes described in Haselhoff and Gerlach, 1988) can be used to catalytically cleave *Alloiococcus otitidis* mRNA transcripts to thereby inhibit translation of *Alloiococcus otitidis* mRNA. A ribozyme having specificity for an *Alloiococcus otitidis*-encoding nucleic acid can be

designed based upon the nucleotide sequence of an *Alloiococcus otitidis* cDNA disclosed herein. For example, a derivative of a Tetrahymena L-19 IVS RNA can be constructed in which the nucleotide sequence of the active site is complementary to the nucleotide sequence to be cleaved in an *Alloiococcus otitidis*-encoding mRNA. See, 5 *e.g.*, Cech *et al.* U.S. 4,987,071 and Cech *et al.* U.S. 5,116,742 both incorporated herein in their entirety by reference. Alternatively, *Alloiococcus otitidis* mRNA can be used to select a catalytic RNA having a specific ribonuclease activity from a pool of RNA molecules. See, *e.g.*, Bartel and Szostak, 1993.

Alternatively *Alloiococcus otitidis* gene expression is inhibited by targeting 10 nucleotide sequences complementary to the regulatory region of the *Alloiococcus otitidis* gene (*e.g.*, the *Alloiococcus otitidis* gene promoter and/or enhancers) to form triple helical structures that prevent transcription of the *Alloiococcus otitidis* gene in target cells. (See generally, Helene, 1991; Helene *et al.*, 1992; and Maher, 1992).

*Alloiococcus otitidis* gene expression is also inhibited using RNA interference 15 (RNAi). This is a technique for post-transcriptional gene silencing (PTGS), in which target gene activity is specifically abolished with cognate double-stranded RNA (dsRNA). RNAi resembles in many aspects PTGS in plants and has been detected in many invertebrates including trypanosome, hydra, planaria, nematode and fruit fly (*Drosophila melangnoster*). It may be involved in the modulation of transposable element 20 mobilization and antiviral state formation. RNAi in mammalian systems is disclosed in WO 00/63364, which is incorporated by reference herein in its entirety. Basically, dsRNA of at least about 600 nucleotides, homologous to the target is introduced into the cell and a sequence specific reduction in gene activity is observed.

### 25 C. *ALLOIOCOCCUS OTITIDIS* POLYPEPTIDES

In particular embodiments, the present invention provides isolated and purified *Alloiococcus otitidis* polypeptides. Preferably, an *Alloiococcus otitidis* polypeptide of the invention is a recombinant polypeptide. In certain embodiments, an *Alloiococcus otitidis* polypeptide of the present invention comprises the amino acid sequence that has at least 30 70% identity to the amino acid sequence of one of even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof.

An *Alloicoccus otitidis* polypeptide according to the present invention encompasses a polypeptide that comprises: 1) the amino acid sequence shown in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650; (2) functional and non-functional naturally occurring variants or biological equivalents of *Alloicoccus otitidis* polypeptides of in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650; (3) recombinantly produced variants or biological equivalents of *Alloicoccus otitidis* polypeptides set out in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650; (4) polypeptides isolated from organisms other than *Alloicoccus otitidis* (orthologs of *Alloicoccus otitidis* polypeptides).

A biological equivalent or variant of an *Alloicoccus otitidis* polypeptide according to the present invention encompasses 1) a polypeptide isolated from *Alloicoccus otitidis*; and 2) a polypeptide that contains substantial homology to an *Alloicoccus otitidis* polypeptide.

Biological equivalents or variants of *Alloicoccus otitidis* include both functional and non-functional *Alloicoccus otitidis* polypeptides. Functional biological equivalents or variants are naturally occurring amino acid sequence variants of an *Alloicoccus otitidis* polypeptide that maintain the ability to elicit an immunological or antigenic response in a subject. Functional variants will typically contain only conservative substitutions of one or more amino acids in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650 or substitution, deletion or insertion of non-critical residues in non-critical regions of the polypeptide (e.g., not in regions containing antigenic determinants or protective epitopes).

The present invention further provides non-*Alloicoccus otitidis* orthologs of *Alloicoccus otitidis* polypeptides. Orthologs of *Alloicoccus otitidis* polypeptides are polypeptides that are isolated from non-*Alloicoccus otitidis* organisms and possess antigenic capabilities of the *Alloicoccus otitidis* polypeptide. Orthologs of an *Alloicoccus otitidis* polypeptide can readily be identified as comprising an amino acid sequence that is substantially homologous to one of the even numbered sequences set forth in set forth in SEQ ID NO: 2 through SEQ ID NO: 6650.

Modifications and changes can be made in the structure of a polypeptide of the present invention and still obtain a molecule having *Alloicoccus otitidis* antigenicity. For example, certain amino acids can be substituted for other amino acids in a sequence

without appreciable loss of antigenicity. Because it is the interactive capacity and nature of a polypeptide that defines that polypeptide's biological functional activity, certain amino acid sequence substitutions can be made in a polypeptide sequence (or, of course, its underlying DNA coding sequence) and nevertheless obtain a polypeptide with like properties.

In making such changes, the hydropathic index of amino acids can be considered. The importance of the hydropathic amino acid index in conferring interactive biologic function on a polypeptide is generally understood in the art (Kyte & Doolittle, 1982). It is known that certain amino acids can be substituted for other amino acids having a similar hydropathic index or score and still result in a polypeptide with similar biological activity. Each amino acid has been assigned a hydropathic index on the basis of its hydrophobicity and charge characteristics. Those indices are: isoleucine (+4.5); valine (+4.2); leucine (+3.8); phenylalanine (+2.8); cysteine/cystine (+2.5); methionine (+1.9); alanine (+1.8); glycine (-0.4); threonine (-0.7); serine (-0.8); tryptophan (-0.9); tyrosine (-1.3); proline (-1.6); histidine (-3.2); glutamate (-3.5); glutamine (-3.5); aspartate (-3.5); asparagine (-3.5); lysine (-3.9); and arginine (-4.5).

It is believed that the relative hydropathic character of the amino acid residue determines the secondary and tertiary structure of the resultant polypeptide, which in turn defines the interaction of the polypeptide with other molecules, such as enzymes, substrates, receptors, antibodies, antigens, and the like. It is known in the art that an amino acid can be substituted by another amino acid having a similar hydropathic index and still obtain a functionally equivalent polypeptide. In such changes, the substitution of amino acids whose hydropathic indices are within  $\pm 2$  is preferred, those within  $\pm 1$  are particularly preferred, and those within  $\pm 0.5$  are even more particularly preferred.

Substitution of like amino acids can also be made on the basis of hydrophilicity, particularly where the biologically functional equivalent polypeptide or peptide thereby created is intended for use in immunological embodiments. U.S. Pat. No. 4,554,101, incorporated herein by reference, states that the greatest local average hydrophilicity of a polypeptide, as governed by the hydrophilicity of its adjacent amino acids, correlates with its immunogenicity and antigenicity, *i.e.* with a biological property of the polypeptide.

As detailed in U.S. Pat. No. 4,554,101, the following hydrophilicity values have been assigned to amino acid residues: arginine (+3.0); lysine (+3.0); aspartate (+3.0  $\pm 1$ ); glutamate (+3.0  $\pm 1$ ); serine (+0.3); asparagine (+0.2); glutamine (+0.2); glycine (0);

proline ( $-0.5 \pm 1$ ); threonine ( $-0.4$ ); alanine ( $-0.5$ ); histidine ( $-0.5$ ); cysteine ( $-1.0$ ); methionine ( $-1.3$ ); valine ( $-1.5$ ); leucine ( $-1.8$ ); isoleucine ( $-1.8$ ); tyrosine ( $-2.3$ ); phenylalanine ( $-2.5$ ); tryptophan ( $-3.4$ ). It is understood that an amino acid can be substituted for another having a similar hydrophilicity value and still obtain a biologically equivalent, and in particular, an immunologically equivalent polypeptide. In such changes, the substitution of amino acids whose hydrophilicity values are within  $\pm 2$  is preferred, those that are within  $\pm 1$  are particularly preferred, and those within  $\pm 0.5$  are even more particularly preferred.

As outlined above, amino acid substitutions are generally therefore based on the relative similarity of the amino acid side-chain substituents, for example, their hydrophobicity, hydrophilicity, charge, size, and the like. Exemplary substitutions which take various of the foregoing characteristics into consideration are well known to those of skill in the art and include: arginine and lysine; glutamate and aspartate; serine and threonine; glutamine and asparagine; and valine, leucine and isoleucine (see Table 23, below). The present invention thus contemplates functional or biological equivalents of an *Alloiococcus otitidis* polypeptide as set forth above.

**TABLE 23**  
**AMINO ACID SUBSTITUTIONS**

Original Residue	Exemplary Residue Substitution
Ala	Gly; Ser
Arg	Lys
Asn	Gln; His
Asp	Glu
Cys	Ser
Gln	Asn

**TABLE 23**  
**AMINO ACID SUBSTITUTIONS**

<b>Original Residue</b>	<b>Exemplary Residue Substitution</b>
Glu	Asp
Gly	Ala
His	Asn; Gln
Ile	Leu; Val
Leu	Ile; Val
Lys	Arg
Met	Met; Leu; Tyr
Ser	Thr
Thr	Ser
Trp	Tyr
Tyr	Trp; Phe
Val	Ile; Leu

Biological or functional equivalents of a polypeptide are also prepared using site-specific mutagenesis. Site-specific mutagenesis is a technique useful in the preparation of second generation polypeptides, or biologically functional equivalent polypeptides or peptides, derived from the sequences thereof, through specific mutagenesis of the underlying DNA. As noted above, such changes can be desirable where amino acid substitutions are desirable. The technique further provides a capacity to prepare and test sequence variants, for example, incorporating one or more of the foregoing considerations, by introducing one or more nucleotide sequence changes into the DNA. Site-specific mutagenesis allows the production of mutants through the use of specific oligonucleotide sequences which encode the DNA sequence of the desired mutation, as well as a sufficient number of adjacent nucleotides, to provide a primer sequence of sufficient size and sequence complexity to form a stable duplex on both sides of the deletion junction being traversed. Typically, a primer of about 17 to 25 nucleotides in length is preferred, with about 5 to 10 residues on both sides of the site of the alteration of the sequence.



In general, the technique of site-specific mutagenesis is well known in the art. As will be appreciated, the technique typically employs a phage vector that can exist in both a single stranded and double stranded form. Typically, site-directed mutagenesis in accordance herewith is performed by first obtaining a single-stranded vector which includes within its sequence a DNA sequence which encodes all or a portion of the *Alloicoccus otitidis* polypeptide sequence selected. An oligonucleotide primer bearing the desired mutated sequence is prepared (*e.g.*, synthetically). This primer is then annealed to the singled-stranded vector, and extended by the use of enzymes such as *Escherichia coli* polymerase I Klenow fragment, in order to complete the synthesis of the mutation-bearing strand. Thus, a heteroduplex is formed wherein one strand encodes the original non-mutated sequence and the second strand bears the desired mutation. This heteroduplex vector is then used to transform appropriate cells such as *Escherichia coli* cells and clones are selected which include recombinant vectors bearing the mutation. Commercially available kits come with all the reagents necessary, except the oligonucleotide primers.

An *Alloicoccus otitidis* polypeptide or polypeptide antigen of the present invention is understood to mean any *Alloicoccus otitidis* polypeptide comprising substantial sequence similarity, structural similarity and/or functional similarity to an *Alloicoccus otitidis* polypeptide comprising the amino acid sequence of one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650. In addition, an *Alloicoccus otitidis* polypeptide or polypeptide antigen of the invention is not limited to a particular source. Thus, the invention provides for the general detection and isolation of the polypeptides from a variety of sources.

It is contemplated in the present invention, that an *Alloicoccus otitidis* polypeptide may advantageously be cleaved into fragments for use in further structural or functional analysis, or in the generation of reagents such as *Alloicoccus otitidis*-related polypeptides and *Alloicoccus otitidis*-specific antibodies. This can be accomplished by treating purified or unpurified *Alloicoccus otitidis* polypeptides with a peptidase such as endoproteinase glu-C (Roche Diagnostics Corporation, Indianapolis, IN). Treatment with CNBr is another method by which peptide fragments may be produced from natural *Alloicoccus otitidis* polypeptides. Recombinant techniques also can be used to produce specific fragments of an *Alloicoccus otitidis* polypeptide.

In addition, the Applicants also contemplate that compounds sterically similar to a particular *Alloiococcus otitidis* polypeptide antigen, called peptidomimetics, may be formulated to mimic the key portions of the peptide structure. Peptidemimetics are peptide-containing molecules that mimic elements of protein secondary structure. (See, 5 for example, Johnson *et al.*, 1993.) The underlying rationale behind the use of peptide mimetics is that the peptide backbone of proteins exists chiefly to orient amino acid side chains in such a way as to facilitate molecular interactions, such as those of receptor and ligand.

Successful applications of the peptide mimetic concept have thus far focused on 10 mimetics of  $\beta$ -turns within proteins. Likely  $\beta$ -turn structures within *Alloiococcus otitidis* proteins can be predicted by computer-based algorithms as discussed above. Once the component amino acids of the turn are determined, mimetics can be constructed to achieve a similar spatial orientation of the essential elements of the amino acid side chains, as discussed in Johnson *et al.*, 1993.

15 Fragments of the *Alloiococcus otitidis* polypeptides are also included in the invention. A fragment is a polypeptide having an amino acid sequence that entirely is the same as a part, but not all, of the amino acid sequence. The fragment can comprise, for example, at least 7 or more (e.g., 8, 10 12, 14, 16, 18, 20 or more) contiguous amino acids of an one of amino acid sequence selected from one of the even numbered 20 sequences set forth in SEQ ID NO.: 2 through SEQ ID NO.: 6650. Fragments may be "freestanding" or comprised within a larger polypeptide of which they form a part or region, most preferably as a single, continuous region. In one embodiment, the fragments include at least one epitope of the mature polypeptide sequence.

"Fusion protein" refers to a protein encoded by two, often unrelated, fused genes 25 or fragments thereof. For example, fusion proteins comprising various portions of constant region of immunoglobulin molecules together with another human protein or part thereof have been described. In many cases, employing an immunoglobulin Fc region as a part of a fusion protein is advantageous for use in therapy and diagnosis resulting in, for example, improved pharmacokinetic properties (see, e.g., EP-A 0232 30 2621). On the other hand, for some uses it would be desirable to be able to delete the Fc part after the fusion protein has been expressed, detected and purified.

**D. *Alloiococcus otitidis* Polynucleotide and Polypeptide Variants**

“Variant” as the term is used herein, is a polynucleotide or polypeptide that differs from a reference polynucleotide or polypeptide respectively, but retains essential properties. A typical variant of a polynucleotide differs in nucleotide sequence from another, reference polynucleotide. Changes in the nucleotide sequence of the variant may or may not alter the amino acid sequence of a polypeptide encoded by the reference polynucleotide. Nucleotide changes may result in amino acid substitutions, additions, deletions, fusions and truncations in the polypeptide encoded by the reference sequence, as discussed below. A typical variant of a polypeptide differs in amino acid sequence from another, reference polypeptide. Generally, differences are limited so that the sequences of the reference polypeptide and the variant are closely similar overall and, in many regions, identical. A variant and reference polypeptide may differ in amino acid sequence by one or more substitutions, additions and deletions in any combination. A substituted or inserted amino acid residue may or may not be one encoded by the genetic code. A variant of a polynucleotide or polypeptide may be a naturally occurring such as an allelic variant, or it may be a variant that is not known to occur naturally. Non-naturally occurring variants of polynucleotides and polypeptides may be made by mutagenesis techniques or by direct synthesis.

“Identity,” as known in the art, is a relationship between two or more polypeptide sequences or two or more polynucleotide sequences, as determined by comparing the sequences. In the art, “identity” also means the degree of sequence relatedness between polypeptide or polynucleotide sequences, as the case may be, as determined by the match between strings of such sequences. “Identity” can be readily calculated by known methods, including but not limited to those described in (Computational Molecular Biology, Lesk, A. M., ed., Oxford University Press, New York, 1988; Biocomputing: Informatics and Genome Projects, Smith, D. W., ed., Academic Press, New York, 1993; Computer Analysis of Sequence Data, Part I, Griffin, A. M., and Griffin, H. G., eds., Humana Press, New Jersey, 1994; Sequence Analysis in Molecular Biology, von Heinje, G., Academic Press, 1987; and Sequence Analysis Primer, Gribskov, M. and Devereux, J., eds., M Stockton Press, New York, 1991; and Carillo, H., and Lipman, D., SIAM J. Applied Math., 48: 1073 (1988). Preferred methods to determine identity are designed to give the largest match between the sequences tested. Methods to determine identity are codified in publicly available computer programs. Preferred computer program methods

to determine identity between two sequences include, but are not limited to, the GCG program package (Devereux, J., *et al* 1984), BLASTP, BLASTN, and FASTA (Altschul, S. F., *et al.*, 1990. The BLASTX program is publicly available from NCBI and other sources (BLAST Manual, Altschul, S., *et al.*, NCBI NLM NIH Bethesda, Md. 20894; Altschul, S., *et al.*, 1990). The well-known Smith-Waterman algorithm may also be used to determine identity. (Smith, T.L. and Waterman, M.S., 1981).

By way of example, a polynucleotide sequence of the present invention may be identical to the reference sequence of one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649, that is be 100% identical, or it may include up to a certain integer number of nucleotide alterations as compared to the reference sequence. Such alterations are selected from the group consisting of at least one nucleotide deletion, substitution, including transition and transversion, or insertion, and wherein said alterations may occur at the 5' or 3' terminal positions of the reference nucleotide sequence or anywhere between those terminal positions, interspersed either individually among the nucleotides in the reference sequence or in one or more contiguous groups within the reference sequence. The number of nucleotide alterations is determined by multiplying the total number of nucleotides in one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649 by the numerical percent of the respective percent identity (divided by 100) and subtracting that product from said total number of nucleotides in one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649.

For example, the alterations in an isolated *Alloiooccus otitidis* polynucleotide comprising a polynucleotide sequence that has at least 70% identity to the nucleic acid sequence of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649; a degenerate variant thereof or a fragment thereof, wherein the polynucleotide sequence may include up to  $n_n$  nucleic acid alterations over the entire polynucleotide region of the nucleic acid sequence of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, wherein  $n_n$  is the maximum number of alterations and is calculated by the formula:

$$n_n \leq x_n - (x_n \bullet y),$$

in which  $x_n$  is the total number of nucleic acids of one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO:6649 and  $y$  has a value of 0.70, wherein any non-integer product of  $x_n$  and  $y$  is rounded down to the nearest integer prior to

subtracting such product from  $x_n$ . Furthermore,  $y$  may also have a value of 0.80 for 80%, 0.85 for 85%, 0.90 for 90% 0.95 for 95%, *etc.*

Similarly, a polypeptide sequence of the present invention may be identical to the reference sequence of one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, that is 100% identical, or it may include up to a certain integer number of amino acid alterations as compared to the reference sequence such that the percentage identity is less than 100%. Such alterations are selected from the group consisting of at least one amino acid deletion, substitution, including conservative and non-conservative substitution, or insertion, and wherein said alterations may occur at the amino- or carboxy-terminal positions of the reference polypeptide sequence or anywhere between those terminal positions, interspersed either individually among the amino acids in the reference sequence or in one or more contiguous groups within the reference sequence. The number of amino acid alterations for a given % identity is determined by multiplying the total number of amino acids in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650 by the numerical percent of the respective percent identity (divided by 100) and then subtracting that product from said total number of amino acids in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, or:

$$n_a \leq x_a - (x_a \cdot y),$$

wherein  $n_a$  is the number of amino acid alterations,  $x_a$  is the total number of amino acids in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, and  $y$  is, for instance 0.70 for 70%, 0.80 for 80%, 0.85 for 85% *etc.*, and wherein any non-integer product of  $x_a$  and  $y$  is rounded down to the nearest integer prior to subtracting it from  $x_a$ .

#### **E. VECTORS, HOST CELLS AND RECOMBINANT *ALLOIOCOCCUS OTITIDIS* POLYPEPTIDES**

In a preferred embodiment, the present invention provides expression vectors comprising ORF polynucleotides that encode *Alloiococcus otitidis* polypeptides. Preferably, the expression vectors of the present invention comprise ORF polynucleotides that encode *Alloiococcus otitidis* polypeptides comprising the amino acid residue sequence of one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650. More preferably, the expression vectors of the present invention comprise a polynucleotide comprising the nucleotide base sequence of one of

the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649. Even more preferably, the expression vectors of the invention comprise a polynucleotide operatively linked to a promoter. Still more preferably, the expression vectors of the invention comprise a polynucleotide operatively linked to a prokaryotic promoter.

5 Alternatively, the expression vectors of the present invention comprise a polynucleotide operatively linked to an enhancer-promoter, that is, an eukaryotic promoter. The expression vectors further comprise a polyadenylation signal that is positioned 3' of the codon encoding the carboxy-terminal amino acid and within a transcriptional unit of the encoded polypeptide.

10 Expression of proteins in prokaryotes is most often carried out in *Escherichia coli* with vectors containing constitutive or inducible promoters directing the expression of either fusion or non-fusion proteins. Fusion vectors add a number of amino acids to a protein encoded therein, usually to the amino terminus of the recombinant protein. Such fusion vectors typically serve three purposes: 1) to increase expression of recombinant protein; 2) to increase the solubility of the recombinant protein; and 3) to aid in the  
15 purification of the recombinant protein by acting as a ligand in affinity purification. Often, in fusion expression vectors, a proteolytic cleavage site is introduced at the junction of the fusion moiety and the recombinant protein to enable separation of the recombinant protein from the fusion moiety subsequent to purification of the fusion protein. Such  
20 enzymes, and their cognate recognition sequences, include Factor Xa, thrombin and enterokinase.

Typical fusion expression vectors include pGEX (Pharmacia Biotech Inc;), pMAL (New England Biolabs, Beverly, MA) and pRIT5 (Pharmacia, Piscataway, NJ) which fuse glutathione S- transferase (GST), maltose E binding protein, or protein A, respectively, to  
25 the target recombinant protein.

In one embodiment, the coding sequence of the *Alloicoccus otitidis* polynucleotide is cloned into a pGEX expression vector to create a vector encoding a fusion protein comprising, from the N-terminus to the C-terminus, GST-thrombin cleavage site-*Alloicoccus otitidis* polypeptide. The fusion protein is purified by affinity  
30 chromatography using glutathione-agarose resin. Recombinant *Alloicoccus otitidis* polypeptide unfused to GST is recovered by cleavage of the fusion protein with thrombin.

Examples of suitable inducible non-fusion *Escherichia coli* expression vectors include pTrc (Amann *et al.*, 1988) and pET 11 d (Studier *et al.*, 1990). Target gene

expression from the pTrc vector relies on host RNA polymerase transcription from a hybrid trp-lac fusion promoter. Target gene expression from the pET II vector relies on transcription from a T7 gene1 lac fusion promoter mediated by a coexpressed viral RNA polymerase T7 gene1. This viral polymerase is supplied by host strains BL21 (DE3) or HMS I 74(DE3) from a resident prophage harboring a T7 gene1 gene under the transcriptional control of the lacUV 5 promoter.

One strategy to maximize recombinant protein expression in *Escherichia coli* is to express the protein in a host bacterium with an impaired capacity to proteolytically cleave the recombinant protein. Another strategy is to alter the nucleic acid sequence of the nucleic acid to be inserted into an expression vector so that the individual codons for each amino acid are those preferentially utilized in *Escherichia coli*. Such alteration of nucleic acid sequences of the invention can be carried out by standard DNA mutagenesis or synthesis techniques.

In another embodiment, the *Alloiococcus otitidis* polynucleotide expression vector is a yeast expression vector. Examples of vectors for expression in a yeast such as *S. cerevisiae* include pYepSec I (Baldari, *et al.*, 1987), pMFa (Kurjan and Herskowitz, 1982), pJRY88 (Schultz *et al.*, 1987), and pYES2 (Invitrogen Corporation, San Diego, CA).

Alternatively, an *Alloiococcus otitidis* polynucleotide is expressed in insect cells using, for example, baculovirus expression vectors. Baculovirus vectors available for expression of proteins in cultured insect cells (*e.g.*, Sf 9 or Sf 21 cells) include the pAc series (Smith *et al.*, 1983) and the pVL series (Lucklow and Summers, 1989).

In yet another embodiment, a nucleic acid of the invention is expressed in mammalian cells using a mammalian expression vector. Examples of mammalian expression vectors include pCDM8 (Seed, 1987) and pMT2PC (Kaufman *et al.*, 1987). When used in mammalian cells, the expression vector's control functions are often provided by viral regulatory elements.

For example, commonly used promoters are derived from polyoma, Adenovirus 2, cytomegalovirus (CMV) and Simian Virus 40 (SV40). For other suitable expression systems for both prokaryotic and eukaryotic cells see chapters 16 and 17 of Sambrook *et al.*, "Molecular Cloning: A Laboratory Manual" 2nd, ed, Cold Spring Harbor Laboratory, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1989, incorporated herein by reference.

In another embodiment, the recombinant mammalian expression vector is capable of directing expression of the nucleic acid preferentially in a particular cell type (e.g., tissue-specific regulatory elements are used to express the nucleic acid). Tissue-specific regulatory elements are known in the art. Non-limiting examples of suitable tissue-specific promoters include the albumin promoter (liver-specific; Pinkert *et al.*, 1987), lymphoid-specific promoters (Calame and Eaton, 1988), in particular promoters of T cell receptors (Winoto and Baltimore, 1989) and immunoglobulins (Banerji *et al.*, 1983); and Queen and Baltimore (1983)), neuron-specific promoters (e.g., the neurofilament promoter; Byrne and Ruddle, 1989), pancreas-specific promoters (Edlund *et al.*, 1985), and mammary gland-specific promoters (e.g., milk whey promoter; U.S. 4, 873,316 and EP 264,166). Developmentally-regulated promoters are also encompassed, for example the murine hox promoters (Kessel and Gruss, 1990) and the  $\alpha$ -fetoprotein promoter (Campes and Tilghman, 1989).

The invention further provides a recombinant expression vector comprising a DNA molecule encoding an *Alloiococcus otitidis* polypeptide cloned into the expression vector in an antisense orientation. That is, the DNA molecule is operatively linked to a regulatory sequence in a manner which allows for expression (by transcription of the DNA molecule) of an RNA molecule which is antisense to *Alloiococcus otitidis* mRNA. Regulatory sequences operatively linked to a nucleic acid cloned in the antisense orientation can be chosen which direct the continuous expression of the antisense RNA molecule in a variety of cell types, for instance viral promoters and/or enhancers, or regulatory sequences can be chosen which direct constitutive, tissue specific or cell type specific expression of antisense RNA. The antisense expression vector can be in the form of a recombinant plasmid, phagemid or attenuated virus in which antisense nucleic acids are produced under the control of a high efficiency regulatory region, the activity of which can be determined by the cell type into which the vector is introduced.

Another aspect of the invention pertains to host cells into which a recombinant expression vector of the invention has been introduced. The terms "host cell" and "recombinant host cell" are used interchangeably herein. It is understood that such terms refer not only to the particular subject cell but also to the progeny or potential progeny of such a cell. Because certain modifications may occur in succeeding generations due to either mutation or environmental influences, such progeny may not, in fact, be identical to the parent cell, but are still included within the scope of the term as



used herein. A host cell can be any prokaryotic or eukaryotic cell. For example, an *Alloiococcus otitidis* polypeptide can be expressed in bacterial cells such as *Escherichia coli*, insect cells, yeast or mammalian cells (such as Chinese hamster ovary cells (CHO), NIH3T3, PER C6, NSO or COS cells). Other suitable host cells are known to those skilled in the art.

Vector DNA can be introduced into prokaryotic or eukaryotic cells via conventional transformation, infection or transfection techniques. As used herein, the terms "transformation" and "transfection" are intended to refer to a variety of art-recognized techniques for introducing foreign nucleic acid (*e.g.*, DNA) into a host cell, including calcium phosphate or calcium chloride co-precipitation, DEAE-dextran-mediated transfection, lipofection, protoplast fusion, direct microinfection. Another recognized technique for introducing DNA into a host cell is "infection", such as by adenovirus infection or electroporation. Suitable methods for transforming, infecting or transfecting host cells can be found in Sambrook, *et al.* ("Molecular Cloning: A Laboratory Manual" 2nd ed, Cold Spring Harbor Laboratory, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1989), and other laboratory manuals.

The most widely used method is transfection mediated by either calcium phosphate or DEAE-dextran. Although the mechanism remains unclear, it is believed that the transfected DNA enters the cytoplasm of the cell by endocytosis and is transported to the nucleus. Depending on the cell type, up to 90% of a population of cultured cells can be transfected at any one time. Because of its high efficiency, transfection mediated by calcium phosphate or DEAE-dextran is the method of choice for experiments that require transient expression of the foreign DNA in large numbers of cells. Calcium phosphate-mediated transfection is also used to establish cell lines that integrate copies of the foreign DNA, which are usually arranged in head-to-tail tandem arrays into the host cell genome.

In the protoplast fusion method, protoplasts derived from bacteria carrying high numbers of copies of plasmid of interest are mixed directly with cultured mammalian cells. After fusion of the cell membranes (usually with polyethylene glycol), the contents of the bacteria are delivered into the cytoplasm of the mammalian cells and the plasmid DNA is transported to the nucleus. Protoplast fusion is not as efficient as transfection for many of the cell lines that are commonly used for transient expression assays, but it is useful for cell lines in which endocytosis of DNA occurs inefficiently. Protoplast fusion

frequently yields multiple copies of the plasmid DNA tandemly integrated into the host chromosome.

The application of brief, high-voltage electric pulses (electroporation) to a variety of mammalian and plant cells leads to the formation of nanometer-sized pores in the plasma membrane. DNA is taken directly into the cell cytoplasm either through these pores or as a consequence of the redistribution of membrane components that accompanies closure of the pores. Electroporation can be extremely efficient and can be used both for transient expression of cloned genes and for establishment of cell lines that carry integrated copies of the gene of interest. Electroporation, in contrast to calcium phosphate-mediated transfection and protoplast fusion, frequently gives rise to cell lines that carry one, or at most a few, integrated copies of the foreign DNA.

Liposome transfection involves encapsulation of DNA and RNA within liposomes, followed by fusion of the liposomes with the cell membrane. The mechanism of how DNA is delivered into the cell is unclear, but transfection efficiencies can be as high as 90%.

Direct microinjection of a DNA molecule into nuclei has the advantage of not exposing DNA to cellular compartments such as low-pH endosomes. Microinjection therefore used primarily as a method to establish lines of cells that carry integrated copies of the DNA of interest.

The use of adenovirus as a vector for cell transfection is well known in the art. Adenovirus vector-mediated cell transfection has been reported for various cells (Stratford-Perricaudet, *et al.* 1992).

A host cell of the invention, such as a prokaryotic or eukaryotic host cell in culture, is used to produce (*i.e.*, express) one or more *Alloiococcus otitidis* polypeptides. Accordingly, the invention further provides methods for producing an *Alloiococcus otitidis* polypeptide using the host cells of the invention. In one embodiment, the method comprises culturing the host cell of invention (into which a recombinant expression vector encoding an *Alloiococcus otitidis* polypeptide has been introduced) in a suitable medium until the *Alloiococcus otitidis* polypeptide is produced. In another embodiment, the method further comprises isolating the *Alloiococcus otitidis* polypeptide from the medium or the host cell.

As used herein, a promoter is a region of a DNA molecule typically within about 100 nucleotide pairs in front of (upstream of) the point at which transcription begins (*i.e.*,

a transcription start site). That region typically contains several types of DNA sequence elements that are located in similar relative positions in different genes. As used herein, the term "promoter" includes what is referred to in the art as an upstream promoter region, a promoter region or a promoter of a generalized eukaryotic RNA Polymerase II transcription unit.

Another type of discrete transcription regulatory sequence element is an enhancer. An enhancer provides specificity of time, location and expression level for a particular encoding region (*e.g.*, gene). A major function of an enhancer is to increase the level of transcription of a coding sequence in a cell that contains one or more transcription factors that bind to that enhancer. Unlike a promoter, an enhancer can function when located at variable distances from transcription start sites so long as a promoter is present.

As used herein, the phrase "enhancer-promoter" means a composite unit that contains both enhancer and promoter elements. An enhancer-promoter is operatively linked to a coding sequence that encodes at least one gene product. As used herein, the phrase "operatively linked" means that an enhancer-promoter is connected to a coding sequence in such a way that the transcription of that coding sequence is controlled and regulated by that enhancer-promoter. Means for operatively linking an enhancer-promoter to a coding sequence are well known in the art. As is also well known in the art, the precise orientation and location relative to a coding sequence whose transcription is controlled, is dependent *inter alia* upon the specific nature of the enhancer-promoter. Thus, a TATA box minimal promoter is typically located from about 25 to about 30 base pairs upstream of a transcription initiation site and an upstream promoter element is typically located from about 100 to about 200 base pairs upstream of a transcription initiation site. In contrast, an enhancer can be located downstream from the initiation site and can be at a considerable distance from that site.

An enhancer-promoter used in a vector construct of the present invention can be any enhancer-promoter that drives expression in a cell to be transfected. By employing an enhancer-promoter with well-known properties, the level and pattern of gene product expression can be optimized.

A coding sequence of an expression vector is operatively linked to a transcription termination region. RNA polymerase transcribes an encoding DNA sequence through a site where polyadenylation occurs. Typically, DNA sequences located a few hundred

base pairs downstream of the polyadenylation site serve to terminate transcription. Those DNA sequences are referred to herein as transcription-termination regions. Those regions are required for efficient polyadenylation of transcribed messenger RNA (mRNA). Transcription-terminating regions are well known in the art. A preferred  
5 transcription-terminating region used in a vector construct of the present invention comprises a polyadenylation signal of SV40 or the protamine gene. The bGH polyadenylation signal is also suitable for use.

An expression vector comprises a polynucleotide that encodes an *Alloiococcus otitidis* polypeptide. Such a polypeptide is meant to include a sequence of nucleotide  
10 bases encoding an *Alloiococcus otitidis* polypeptide sufficient in length to distinguish the segment from a polynucleotide segment encoding a non-*Alloiococcus otitidis* polypeptide. A polypeptide of the invention can also encode biologically functional polypeptides or peptides, which have variant amino acid sequences, such as with changes selected, based on considerations such as the relative hydropathic score of the  
15 amino acids being exchanged. These variant sequences are those isolated from natural sources or induced in the sequences disclosed herein using a mutagenic procedure such as site-directed mutagenesis.

Preferably, an expression vector of the present invention comprises a polynucleotide that encodes a polypeptide comprising the amino acid residue sequence  
20 of one of even numbered sequences set forth in SEQ.ID NO: 2 through SEQ ID NO: 6650. An expression vector can include an *Alloiococcus otitidis* polypeptide coding region itself of any of the *Alloiococcus otitidis* polypeptides noted above or it can contain coding regions bearing selected alterations or modifications in the basic coding region of such an *Alloiococcus otitidis* polypeptide. Alternatively, such vectors or fragments can  
25 encode larger polypeptides or polypeptides which nevertheless include the basic coding region. In any event, it should be appreciated that due to codon redundancy as well as biological functional equivalence, this aspect of the invention is not limited to the particular DNA molecules corresponding to the polypeptide sequences noted above.

Exemplary vectors include the mammalian expression vectors of the pCMV family  
30 including pCMV6b and pCMV6c (Chiron Corp., Emeryville CA.). In certain cases, and specifically in the case of these individual mammalian expression vectors, the resulting constructs can require co-transfection with a vector containing a selectable marker such as pSV2neo. Via co-transfection into a dihydrofolate reductase-deficient Chinese

hamster ovary cell line, such as DG44, clones expressing *Alloiococcus otitidis* polypeptides by virtue of DNA incorporated into such expression vectors can be detected.

A DNA molecule of the present invention can be incorporated into a vector by a number of techniques that are well known in the art. For instance, the vector pUC18 has been demonstrated to be of particular value in cloning and expression of genes. Likewise, the related vectors M13mp18 and M13mp19 can also be used in certain embodiments of the invention, in particular, in performing dideoxy sequencing.

An expression vector of the present invention is useful both as a means for preparing quantities of the *Alloiococcus otitidis* polypeptide-encoding DNA itself, and as a means for preparing the encoded polypeptide and peptides. It is contemplated that where *Alloiococcus otitidis* polypeptides of the invention are made by recombinant means, one can employ either prokaryotic or eukaryotic expression vectors as shuttle systems. In another aspect, the recombinant host cells of the present invention are prokaryotic host cells. Preferably, the recombinant host cells of the invention are bacterial cells of the DH5 $\alpha$  strain of *Escherichia coli*. In general, prokaryotes are preferred for the initial cloning of DNA sequences and constructing the vectors useful in the invention. For example, *Escherichia coli* K12 strains can be particularly useful. Other microbial strains that can be used include *Escherichia coli* B, *Escherichia coli* W3110 (ATCC No. 273325) and *Escherichia. coli*<sub>x</sub>1976 (ATCC No. 31537). *Bacilli* such as *Bacillus subtilis*, or other enterobacteriaceae such as *Salmonella typhimurium* or *Serratia marcesans*, and various *Pseudomonas* species can be used. These examples are, of course, intended to be illustrative rather than limiting.

In general, plasmid vectors containing replicon and control sequences that are derived from species compatible with the host cell are used in connection with these hosts. The vector ordinarily carries a replication site, as well as marking sequences that are capable of providing phenotypic selection in transformed cells. For example, *Escherichia coli* is transformed using pBR322, a plasmid derived from an *Escherichia coli* species (Bolivar, *et al.* 1977). pBR322 contains genes for ampicillin and tetracycline resistance and thus provides an easy means for identifying transformed cells. The pBR322 plasmid, or other microbial plasmid or phage, must also contain, or be modified to contain, promoters, which can be used by the microbial organism for expression of its own polypeptides.

Those promoters most commonly used in recombinant DNA construction include the  $\beta$ -lactamase (penicillinase) and lactose promoter systems (Chang, *et al.* 1978; Itakura, *et al.* 1977, Goeddel, *et al.* 1979; Goeddel, *et al.* 1980) and a tryptophan (TRP) promoter system (EP 0036776; Siebwenlist *et al.* 1980). While these are the most commonly used, other microbial promoters have been discovered and utilized, and details concerning their nucleotide sequences have been published, enabling a skilled worker to introduce functional promoters into plasmid vectors (Siebwenlist, *et al.* 1980).

In addition to prokaryotes, eukaryotic microbes such as yeast can also be used. *Saccharomyces cerevisiae* or common baker's yeast is the most commonly used among eukaryotic microorganisms, although a number of other strains are commonly available. For expression in *Saccharomyces*, the plasmid YRp7, for example, is commonly used (Stinchcomb, *et al.* 1979; Kingsman, *et al.* 1979; Tschemper, *et al.* 1980). This plasmid already contains the *trp1* gene that provides a selection marker for a mutant strain of yeast lacking the ability to grow in tryptophan, for example ATCC No. 44076 or PEP4-1 (Jones, 1977). The presence of the *trp1* lesion as a characteristic of the yeast host cell genome then provides an effective environment for detecting transformation by growth in the absence of tryptophan.

Suitable promoter sequences in yeast vectors include the promoters for 3-phosphoglycerate kinase (PGK) (Hitzeman, *et al.* 1980) or other glycolytic enzymes such as enolase, glyceraldehyde-3-phosphate dehydrogenase, hexokinase, pyruvate decarboxylase, phosphofructokinase, glucose-6-phosphate isomerase, 3-phosphoglycerate mutase, pyruvate kinase, triosephosphate isomerase, phosphoglucose isomerase, and glucokinase. In constructing suitable expression plasmids, the termination sequences associated with these genes are also introduced into the expression vector downstream from the sequences to be expressed to provide polyadenylation of the mRNA and termination. Other promoters, which have the additional advantage of transcription controlled by growth conditions are the promoter region for alcohol dehydrogenase 2, isocytochrome C, acid phosphatase, degradative enzymes associated with nitrogen metabolism, and the aforementioned glyceraldehyde-3-phosphate dehydrogenase, and enzymes responsible for maltose and galactose utilization. Any plasmid vector containing a yeast-compatible promoter, origin of replication, and termination sequences is suitable.

In addition to microorganisms, cultures of cells derived from multicellular organisms can also be used as hosts. In principle, any such cell culture is workable, whether from vertebrate or invertebrate culture. However, interest has been greatest in vertebrate cells, and propagation of vertebrate cells in culture (tissue culture) has become a routine procedure in recent years. Examples of such useful host cell lines are AtT-20, VERO, HeLa, NSO, PER C6, Chinese hamster ovary (CHO) cell lines, W138, BHK, COSM6, COS-7, 293 and MDCK cell lines. Expression vectors for such cells ordinarily include (if necessary) an origin of replication, a promoter located upstream of the gene to be expressed, along with any necessary ribosome binding sites, RNA splice sites, polyadenylation site, and transcriptional terminator sequences.

Where expression of recombinant *Alloiococcus otitidis* polypeptides is desired and a eukaryotic host is contemplated, it is most desirable to employ a vector, such as a plasmid, that incorporates a eukaryotic origin of replication. Additionally, for the purposes of expression in eukaryotic systems, one desires to position the *Alloiococcus otitidis* encoding sequence adjacent to and under the control of an effective eukaryotic promoter such as promoters used in combination with Chinese hamster ovary cells (CHO). To bring a coding sequence under control of a promoter, whether it is eukaryotic or prokaryotic, what is generally needed is to position the 5' end of the translation initiation site of the proper translational reading frame of the polypeptide between about 1 and about 50 nucleotides 3' of (downstream) the promoter chosen. Furthermore, where eukaryotic expression is anticipated, one would typically desire to incorporate an appropriate polyadenylation site into the transcriptional unit that includes the *Alloiococcus otitidis* polypeptide.

A transfected cell can be prokaryotic or eukaryotic. Preferably, the host cells of the invention are prokaryotic host cells. Where it is of interest to produce an *Alloiococcus otitidis* polypeptide, cultured prokaryotic host cells are of particular interest.

In yet another embodiment, the present invention contemplates a process or method of preparing *Alloiococcus otitidis* polypeptides comprising transfecting, transforming or infecting cells with a polynucleotide that encodes an *Alloiococcus otitidis* polypeptide to produce transformed host cells; and maintaining the transformed host cells under biological conditions sufficient for expression of the polypeptide. Preferably, the transformed host cells are prokaryotic cells. Alternatively, the host cells are eukaryotic cells. More preferably, the prokaryotic cells are bacterial cells of the DH5 $\alpha$ .

strain of *Escherichia coli*. Even more preferably, the polynucleotide transfected into the transformed cells comprises the nucleic acid sequence of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649. Additionally, transfection is accomplished using an expression vector disclosed above. A host cell  
5 used in the process is capable of expressing a functional, recombinant *Alloiococcus otitidis* polypeptide.

Following transfection, the cell is maintained under culture conditions for a period of time sufficient for expression of an *Alloiococcus otitidis* polypeptide. Culture conditions are well known in the art and include ionic composition and concentration,  
10 temperature, pH and the like. Typically, transfected cells are maintained under culture conditions in a culture medium. Suitable media for various cell types are well known in the art. In a preferred embodiment, temperature is from about 20°C to about 50°C, more preferably from about 30°C to about 40°C and, even more preferably about 37°C.

The pH is preferably from about a value of 6.0 to a value of about 8.0, more  
15 preferably from about a value of about 6.8 to a value of about 7.8 and, most preferably about 7.4. Osmolality is preferably from about 200 milliosmols per liter (mosm/L) to about 400 mosm/l and, more preferably from about 290 mosm/L to about 310 mosm/L. Other biological conditions needed for transfection and expression of an encoded protein are well known in the art.

20 Transfected cells are maintained for a period of time sufficient for expression of an *Alloiococcus otitidis* polypeptide. A suitable time depends *inter alia* upon the cell type used and is readily determinable by a skilled artisan. Typically, maintenance time is from about 2 to about 14 days.

Recombinant *Alloiococcus otitidis* polypeptide is recovered or collected either  
25 from the transfected cells or the medium in which those cells are cultured. Recovery comprises isolating and purifying the *Alloiococcus otitidis* polypeptide. Isolation and purification techniques for polypeptides are well known in the art and include such procedures as precipitation, filtration, chromatography, electrophoresis and the like.

#### 30 **F. ANTIBODIES IMMUNOREACTIVE WITH *ALLOIOCOCCUS OTITIDIS* POLYPEPTIDES**

In still another embodiment, the present invention provides antibodies immunoreactive with *Alloiococcus otitidis* polypeptides. Preferably, the antibodies of the



invention are monoclonal antibodies. Additionally, the *Alloiococcus otitidis* polypeptides comprise the amino acid residue sequence of one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650. Means for preparing and characterizing antibodies are well known in the art (see, e.g., Antibodies "A Laboratory Manual", E. Howell and D. Lane, Cold Spring Harbor Laboratory, 1988). Polyclonal antisera is obtained by bleeding an immunized animal into a glass or plastic container, incubating the blood at 25°C for one hour, followed by incubating at 4°C for 2-18 hours. The serum is then recovered by centrifugation.

Briefly, a polyclonal antibody is prepared by immunizing the animal with an immunogen comprising a polypeptide or polynucleotide of the present invention, and collecting antisera from that immunized animal. A wide range of animal species can be used for the production of antisera. Typically an animal used for production of anti-antisera is a rabbit, a mouse, a rat, a hamster or a guinea pig. Because of the relatively large blood volume of rabbits, a rabbit is a preferred choice for production of polyclonal antibodies.

As is well known in the art, a given polypeptide or polynucleotide may vary in its immunogenicity. It is often necessary therefore to couple the immunogen (e.g., a polypeptide or polynucleotide) of the present invention with a carrier. Exemplary and preferred carriers are keyhole limpet hemocyanin (KLH) and bovine serum albumin (BSA). Other albumins such as ovalbumin, mouse serum albumin or rabbit serum albumin can also be used as carriers.

Means for conjugating a polypeptide or a polynucleotide to a carrier protein are well known in the art and include glutaraldehyde, m-maleimidobencoyl-N-hydroxysuccinimide ester, carbodiimide and bis-biazotized benzidine.

The amount of immunogen used for the production of polyclonal antibodies varies *inter alia*, upon the nature of the immunogen as well as the animal used for immunization. A variety of routes can be used to administer the immunogen (subcutaneous, intramuscular, intradermal, intravenous and intraperitoneal). The production of polyclonal antibodies is monitored by sampling blood from the immunized animal at various points following immunization. When a desired level of immunogenicity is obtained, the immunized animal can be bled and the serum isolated and stored.

In another aspect, the present invention contemplates a process of producing an antibody immunoreactive with an *Alloiococcus otitidis* polypeptide comprising the steps

of (a) transfecting recombinant host cells with a polynucleotide that encodes an *Alloiococcus otitidis* polypeptide; (b) culturing the host cells under conditions sufficient for expression of the polypeptide; (c) recovering the polypeptides; and (d) preparing the antibodies to the polypeptides. Preferably, the host cell is transfected with the polynucleotide of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649. Even more preferably, the present invention provides antibodies prepared according to the process described above.

A monoclonal antibody of the present invention is readily prepared through use of well-known techniques such as those exemplified in U.S. Pat. No. 4,196,265, herein incorporated by reference. Typically, the technique involves first immunizing a suitable animal with a selected antigen (*e.g.*, a polypeptide or polynucleotide of the present invention) in a manner sufficient to provide an immune response. Rodents such as mice and rats are preferred animals. Spleen cells from the immunized animal are then fused with cells of an immortal myeloma cell. Where the immunized animal is a mouse, a preferred myeloma cell is a murine NS-1 myeloma cell.

The fused spleen/myeloma cells are cultured in a selective medium to select fused spleen/myeloma cells from the parental cells. Fused cells are separated from the mixture of non-fused parental cells, *e.g.*, by the addition of agents that block the *de novo* synthesis of nucleotides in the tissue culture media. Exemplary and preferred agents are aminopterin, methotrexate, and azaserine. Aminopterin and methotrexate block *de novo* synthesis of both purines and pyrimidines, whereas azaserine blocks only purine synthesis. Where aminopterin or methotrexate is used, the media is supplemented with hypoxanthine and thymidine as a source of nucleotides. Where azaserine is used, the media is supplemented with hypoxanthine.

This culturing provides a population of hybridomas from which specific hybridomas are selected. Typically, selection of hybridomas is performed by culturing the cells by single-clone dilution in microtiter plates, followed by testing the individual clonal supernatants for reactivity with an antigen-polypeptide. The selected clones are then propagated indefinitely to provide the monoclonal antibody.

By way of specific example, to produce an antibody of the present invention, mice are injected intraperitoneally with between about 1-200  $\mu$ g of an antigen comprising a polypeptide of the present invention. B lymphocyte cells are stimulated to grow by injecting the antigen in association with an adjuvant such as complete Freund's adjuvant

(CFA; a non-specific stimulator of the immune response containing killed *Mycobacterium tuberculosis*). At some time (*e.g.*, at least two weeks) after the first injection, mice are boosted by injection with a second dose of the antigen mixed with incomplete Freund's adjuvant (IFA; lacks the killed mycobacterium of CFA).

5           A few weeks after the second injection, mice are tail bled and the sera titrated by immunoprecipitation against radiolabeled antigen. Preferably, the process of boosting and titrating is repeated until a suitable titer is achieved. The spleen of the mouse with the highest titer is removed and the spleen lymphocytes are obtained by homogenizing the spleen with a syringe. Typically, a spleen from an immunized mouse contains  
10           approximately  $5 \times 10^7$  to  $2 \times 10^8$  lymphocytes.

          Mutant lymphocyte cells known as myeloma cells are obtained from laboratory animals in which such cells have been induced to grow by a variety of well-known methods. Myeloma cells lack the salvage pathway of nucleotide biosynthesis. Because myeloma cells are tumor cells, they can be propagated indefinitely in tissue culture, and  
15           are thus denominated immortal. Numerous cultured cell lines of myeloma cells from mice and rats, such as murine NS-1 myeloma cells, have been established.

          Myeloma cells are combined under conditions appropriate to foster fusion with the normal antibody-producing cells from the spleen of the mouse or rat injected with the antigen/polypeptide of the present invention. Fusion conditions include, for example, the  
20           presence of polyethylene glycol. The resulting fused cells are hybridoma cells. Like myeloma cells, hybridoma cells grow indefinitely in culture.

          Hybridoma cells are separated from unfused myeloma cells by culturing in a selection medium such as HAT media (hypoxanthine, aminopterin, thymidine). Unfused myeloma cells lack the enzymes necessary to synthesize nucleotides from the salvage  
25           pathway because they are killed in the presence of aminopterin, methotrexate, or azaserine. Unfused lymphocytes also do not continue to grow in tissue culture. Thus, only cells that have successfully fused (hybridoma cells) can grow in the selection media.

          Each of the surviving hybridoma cells produces a single antibody. These cells are then screened for the production of the specific antibody immunoreactive with an  
30           antigen/polypeptide of the present invention. Single cell hybridomas are isolated by limiting dilutions of the hybridomas. The hybridomas are serially diluted many times and, after the dilutions are allowed to grow, the supernatant is tested for the presence of the

monoclonal antibody. The clones producing that antibody are then cultured in large amounts to produce an antibody of the present invention in convenient quantity.

By use of a monoclonal antibody of the present invention, specific polypeptides and polynucleotide of the invention are identified as antigens. Once identified, those  
5 polypeptides and polynucleotide are isolated and purified by techniques such as antibody-affinity chromatography. In antibody-affinity chromatography, a monoclonal antibody is bound to a solid substrate and exposed to a solution containing the desired antigen. The antigen is removed from the solution through an immunospecific reaction with the bound antibody. The polypeptide or polynucleotide is then easily removed from  
10 the substrate and purified.

Additionally, examples of methods and reagents particularly amenable for use in generating and screening an antibody display library can be found in, for example, U.S. 5,223,409; WO 92/18619; WO 91/17271; WO 92/20791; WO 92/15679; WO 93/01288; WO 92/01047; WO 92/09690; WO 90/02809, which are incorporated herein in their  
15 entirety by reference.

Additionally, recombinant anti-*Alloiococcus otitidis* antibodies, such as chimeric and humanized monoclonal antibodies, comprising both human and non-human fragments, which are made using standard recombinant DNA techniques, are within the scope of the invention. Such chimeric and humanized monoclonal antibodies are  
20 produced by recombinant DNA techniques known in the art, for example using methods described in PCT/US86/02269; EP 184,187; EP 171,496; EP 173,494; WO 86/01533; U.S. 4,816,567; and EP 125,023.

An anti-*Alloiococcus otitidis* antibody (*e.g.*, monoclonal antibody) is used to isolate *Alloiococcus otitidis* polypeptides by standard techniques, such as affinity  
25 chromatography or immunoprecipitation. An anti-*Alloiococcus otitidis* antibody facilitates the purification of a natural *Alloiococcus otitidis* polypeptide from cells and recombinantly produced *Alloiococcus otitidis* polypeptides expressed in host cells. Moreover, an anti-*Alloiococcus otitidis* antibody is used to detect *Alloiococcus otitidis* polypeptide (*e.g.*, in a cellular lysate or cell supernatant) in order to evaluate the abundance of the *Alloiococcus*  
30 *otitidis* polypeptide. The detection of circulating fragments of an *Alloiococcus otitidis* polypeptide is used to identify *Alloiococcus otitidis* polypeptide turnover in a subject. Anti-*Alloiococcus otitidis* antibodies are used diagnostically to monitor protein levels in tissue as part of a clinical testing procedure, *e.g.*, to, for example, determine the efficacy

of a given treatment regimen. Detection is facilitated by coupling (*i.e.*, physically linking) the antibody to a detectable substance. Examples of detectable substances include various enzymes, prosthetic groups, fluorescent materials, luminescent materials, bioluminescent materials, and radioactive materials. Examples of suitable enzymes  
5 include horseradish peroxidase, alkaline phosphatase, P-galactosidase, or acetylcholinesterase; examples of suitable prosthetic group complexes include streptavidin/biotin and avidin/biotin; examples of suitable fluorescent materials include umbelliferone, fluorescein, fluorescein isothiocyanate, rhodamine, dichlorotriazinylamine fluorescein, dansyl chloride or phycoerythrin; an example of a luminescent material  
10 includes luminol; examples of bioluminescent materials include luciferase, luciferin, and acquorin, and examples of suitable radioactive material include  $^{125}\text{I}$ ,  $^{131}\text{I}$ ,  $^{15}\text{S}$  or  $^3\text{H}$ .

#### **G. PHARMACEUTICAL AND IMMUNOGENIC COMPOSITIONS**

15 In certain embodiments, the present invention provides pharmaceutical and immunogenic compositions comprising *Alloiococcus otitidis* polypeptides, and physiologically acceptable carriers. More preferably, the pharmaceutical and immunogenic compositions comprise *Alloiococcus otitidis* polypeptides comprising the amino acid residue sequence of one or more of the even numbered sequences set forth  
20 in SEQ ID NO: 2 through SEQ ID NO: 6650. In other embodiments, the pharmaceutical and immunogenic compositions of the invention comprise polynucleotides that encode *Alloiococcus otitidis* polypeptides, such as the polynucleotides comprising the nucleotide sequence of one of odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, and physiologically acceptable carriers. Various tests may be used to assess  
25 the *in vitro* immunogenicity of the polypeptides of the invention. For example, an *in vitro* opsonic assay is conducted by incubating together a mixture of *Alloiococcus otitidis* cells, heat inactivated human serum containing specific antibodies to the polypeptide in question, and an exogenous complement source. Opsonophagocytosis proceeds during incubation of freshly isolated human polymorphonuclear cells (PMN) and the  
30 antibody/complement/*Alloiococcus* cell mixture. Bacterial cells that are coated with antibody and complement are killed upon opsonophagocytosis. Colony forming units (cfu) of surviving bacteria that escape from opsonophagocytosis are determined by plating the assay mixture. Titers are reported as the reciprocal of the highest dilution

that gives  $\geq 50\%$  bacterial killing, as determined comparison to assay controls. The method described above is a modification of Gray's method (Gray, B.M., 1990).

A whole *Alloiococcus otitidis* cell ELISA assay is also used to assess *in vitro* immunogenicity and surface exposure of the polypeptide antigen, wherein the bacterial strain of interest (*Alloiococcus otitidis*) is coated onto a plate, such as 96 well plate, and test sera from an immunized animal is reacted with bacterial cells. If any antibody, specific for the test polypeptide antigen, is reactive with surface exposed epitope of the polypeptide antigen, it can be detected by standard methods known to one of skill in the art.

Any polypeptide demonstrating the desired *in vitro* activity is then tested in an *in vivo* animal challenge model. In certain embodiments, immunogenic compositions are used in the immunization of an animal (e.g., a mouse) by methods and routes of immunization known to those of skill in the art (e.g., intranasal, parenteral, intraperitoneal, intravenous, subcutaneous, etc.). Following immunization of the animal with a particular *Alloiococcus otitidis* immunogenic composition, the animal is challenged with *Alloiococcus otitidis* and assayed for resistance to *Alloiococcus otitidis* infection.

The *Alloiococcus otitidis* polynucleotides and polypeptides, and modulators of *Alloiococcus otitidis* polynucleotides and polypeptides, and anti-*Alloiococcus otitidis* antibodies (also referred to herein as "active compounds") of the invention can be incorporated into pharmaceutical and immunogenic compositions suitable for administration to a subject, e.g., a human. Such compositions typically comprise the nucleic acid molecule, protein, modulator, or antibody and a pharmaceutically acceptable carrier. As used herein the language "pharmaceutically acceptable carrier" is intended to include any and all solvents, dispersion media, coatings, antibacterial and antifungal agents, isotonic and absorption delaying agents, and the like, compatible with pharmaceutical administration. The use of such media and agents for pharmaceutically active substances is well known in the art. Except insofar as any conventional media or agent is incompatible with the active compound, such media can be used in the compositions of the invention. Supplementary active compounds can also be incorporated into the compositions.

A pharmaceutical or immunogenic composition of the invention is formulated to be compatible with its intended route of administration. Examples of routes of administration include parenteral, (e.g., intravenous, intradermal, subcutaneous,

intramuscular, and intraperitoneal), mucosal (*e.g.*, oral, rectal, buccal, vaginal, intranasal, inhalation), and transdermal (topical). Solutions or suspensions used for parenteral, intradermal, or subcutaneous application can include the following components: a sterile diluents such as water for injection, saline solution, fixed oils, polyethylene glycols, glycerine, propylene glycol or other synthetic solvents; antibacterial agents such as benzyl alcohol or methyl parabens; antioxidants such as ascorbic acid or sodium bisulfite; chelating agents such as ethylenediaminetetraacetic acid; buffers such as acetates, citrates or phosphates and agents for the adjustment of tonicity such as sodium chloride or dextrose. pH can be adjusted with acids or bases, such as hydrochloric acid or sodium hydroxide. The parenteral preparation can be enclosed in ampoules, disposable syringes or multiple dose vials made of glass or plastic.

Pharmaceutical compositions suitable for injectable use include sterile aqueous solutions (where water soluble) or dispersions and sterile powders for the extemporaneous preparation of sterile injectable solutions or dispersion. For intravenous administration, suitable carriers include physiological saline, bacteriostatic water, Cremophor EL™ (BASF, Parsippany, NJ) or phosphate buffered saline (PBS). In all cases, the composition must be sterile and should be fluid to the extent that easy syringability exists. It must be stable under the conditions of manufacture and storage and must be preserved against the contaminating action of microorganisms such as bacteria and fungi. The carrier is a solvent or dispersion medium containing, for example, water, ethanol, polyol (for example, glycerol, propylene glycol, and liquid polyethylene glycol, and the like), and suitable mixtures thereof. The proper fluidity is maintained, for example, by the use of a coating such as lecithin, by the maintenance of the required particle size in the case of dispersion and by the use of surfactants. Prevention of the action of microorganisms is achieved by various antibacterial and antifungal agents, for example, parabens, chlorobutanol, phenol, ascorbic acid, thimerosal, and the like. In many cases, it is preferable to include isotonic agents, for example, sugars, polyalcohols such as manitol, sorbitol, and sodium chloride in the composition. Prolonged absorption of the injectable compositions is brought about by including in the composition an agent which delays absorption, for example, aluminum monostearate and gelatin.

Sterile injectable solutions are prepared by incorporating the active compound (*e.g.*, an *Alloiococcus otitidis* polypeptide or anti-*Alloiococcus otitidis* antibody) in the

required amount in an appropriate solvent with one or a combination of ingredients enumerated above, as required, followed by filtered sterilization. Generally, dispersions are prepared by incorporating the active compound into a sterile vehicle which contains a basic dispersion medium and the required other ingredients from those enumerated  
5 above. In the case of sterile powders for the preparation of sterile injectable solutions, the preferred methods of preparation are vacuum drying and freeze-drying which yields a powder of the active ingredient plus any additional desired ingredient from a previously sterile-filtered solution thereof.

Oral compositions generally include an inert diluent or an edible carrier. They  
10 can be enclosed in gelatin capsules or compressed into tablets. For the purpose of oral therapeutic administration, the active compound is incorporated with excipients and used in the form of tablets, troches, or capsules. Oral compositions are also prepared using a fluid carrier for use as a mouthwash, wherein the compound in the fluid carrier is applied orally and swished and expectorated or swallowed. Pharmaceutically compatible binding  
15 agents, and/or adjuvant materials can be included as part of the composition. The tablets, pills, capsules, troches and the like can contain any of the following ingredients, or compounds of a similar nature: a binder such as microcrystalline cellulose, gum tragacanth or gelatin; an excipient such as starch or lactose, a disintegrating agent such as alginic acid, Primogel, or corn starch; a lubricant such as magnesium stearate or  
20 Sterotes; a glidant such as colloidal silicon dioxide; a sweetening agent such as sucrose or saccharin; or a flavoring agent such as peppermint, methyl salicylate, or orange flavoring.

For administration by inhalation, the compounds are delivered in the form of an aerosol spray from pressured container or dispenser that contains a suitable propellant,  
25 *e.g.*, a gas such as carbon dioxide, or a nebulizer. Systemic administration can also be by mucosal or transdermal means. For mucosal or transdermal administration, penetrants appropriate to the barrier to be permeated are used in the formulation. Such penetrants are generally known in the art, and include, for example, for mucosal administration, detergents, bile salts, and fusidic acid derivatives. Mucosal  
30 administration is accomplished through the use of nasal sprays or suppositories. For transdermal administration, the active compounds are formulated into ointments, salves, gels, or creams as generally known in the art.



The compounds is also prepared in the form of suppositories (*e.g.*, with conventional suppository bases such as cocoa butter and other glycerides) or retention enemas for rectal delivery.

In one embodiment, the active compounds are prepared with carriers that will  
5 protect the compound against rapid elimination from the body, such as a controlled release formulation, including implants and microencapsulated delivery systems.

Biodegradable, biocompatible polymers can be used, such as ethylene vinyl acetate, polyanhydrides, polyglycolic acid, collagen, polyorthoesters, and polylactic acid. Methods for preparation of such formulations will be apparent to those skilled in the art.  
10 The materials are also obtained commercially from Alza Corporation (Palo Alto, CA) and Nova Pharmaceuticals, Inc. (Clifton, NJ) Liposomal suspensions (including liposomes targeted to infected cells with monoclonal antibodies to viral antigens) are also used as pharmaceutically acceptable carriers. These are prepared according to methods known to those skilled in the art, for example, as described in U.S. 4,522,811, which is  
15 incorporated herein by reference.

It is especially advantageous to formulate oral or parenteral compositions in dosage unit form for ease of administration and uniformity of dosage. Dosage unit form as used herein refers to physically discrete units suited as unitary dosages for the subject to be treated; each unit containing a predetermined quantity of active compound  
20 calculated to produce the desired therapeutic effect in association with the required pharmaceutical carrier. The specification for the dosage unit forms of the invention are dictated by and directly dependent on the unique characteristics of the active compound and the particular therapeutic effect to be achieved, and the limitations inherent in the art of compounding such an active compound for the treatment of individuals.

25 Combination immunogenic compositions are provided by including two or more of the polypeptides of this invention. Multivalent immunogenic compositions directed against various bacteria responsible for causing otitis media comprise one or more of the polypeptides of this invention together with one or more known nontypable *Haemophilus influenzae* polypeptides, including, but not limited to, the P2, P4, P5, P6 and PCP  
30 proteins, and/or one or more known *Moraxella catarrhalis* polypeptides, including, but not limited to, the UspA1, UspA2, B1, C/D, E and 74 kDa proteins, and/or one or more known *Streptococcus pneumoniae* polypeptides and polysaccharide-protein conjugates, including, but not limited to, the currently available 23-valent pneumococcal capsular

polysaccharide vaccine and the 7-valent pneumococcal polysaccharide-protein conjugate vaccine. One particularly preferred multivalent immunogenic composition comprises one or more of *Alloiococcus otitidis* polypeptides of the invention together with P4, P6, and UspA2 polypeptides.

5           The nucleic acid molecules of the invention are inserted into a variety of vectors and expression systems. A great variety of expression systems are used. Such systems include, among others, chromosomal, episomal and virus-derived systems, *e.g.*, vectors derived from bacterial plasmids, attenuated bacteria such as Salmonella (U.S. Patent Number 4,837,151) from bacteriophage, from transposons, from yeast episomes, 10 from insertion elements, from yeast chromosomal elements, from viruses such as vaccinia and other poxviruses, sindbis, adenovirus, baculoviruses, papova viruses, such as SV40, fowl pox viruses, pseudorabies viruses and retroviruses, alphaviruses such as Venezuelan equine encephalitis virus (U.S. Patent Number 5,643,576), nonsegmented negative-stranded RNA viruses such as vesicular stomatitis virus (U.S. Patent Number 15 6,168,943), and vectors derived from combinations thereof, such as those derived from plasmid and bacteriophage genetic elements, such as cosmids and phagemids. The expression systems should include control regions that regulate as well as engender expression, such as promoters and other regulatory elements (such as a polyadenylation signal). Generally, any system or vector suitable to maintain, propagate or express 20 polynucleotides to produce a polypeptide in a host may be used. The appropriate nucleotide sequence may be inserted into an expression system by any of a variety of well-known and routine techniques, such as, for example, those set forth in Sambrook *et al.*, "Molecular Cloning: A Laboratory Manual" 2nd, ed, Cold Spring Harbor Laboratory, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1989.

25           The nucleic acid molecules of the invention inserted into vectors as described above are also used to deliver the nucleic acid molecules to a subject by, for example, intravenous injection, local administration (see U.S. Patent 5,328,470) or by stereotactic injection (see *e.g.*, Chen *et al.*, 1994). The pharmaceutical preparation for the administration of the nucleic acid molecules of the invention include, in addition to the 30 nucleic molecules in an appropriate vector, an acceptable diluent, or can comprise a slow release matrix in which the nucleic acid molecule is embedded. Alternatively, where the complete nucleic acid molecule-r is produced intact from recombinant cells, *e.g.* retroviral vectors, the pharmaceutical preparation includes one or more cells which

produce the gene delivery system. The pharmaceutical compositions are included in a container, pack, or dispenser together with instructions for administration.

A pharmaceutically acceptable vehicle is understood to designate a compound or a combination of compounds entering into a pharmaceutical or immunogenic  
5 composition which does not cause side effects and which makes it possible, for example, to facilitate the administration of the active compound, to increase its life and/or its efficacy in the body, to increase its solubility in solution or alternatively to enhance its preservation. These pharmaceutically acceptable vehicles are well known and will be adapted by persons skilled in the art according to the nature and the mode of  
10 administration of the active compound chosen.

Immunogenic compositions may comprise appropriate adjuvants to modulate, shift and/or boost the immune response of the recipient to the immunogen. Such adjuvants are known to persons skilled in the art, such as those described in section H below.

15 A composition of the present invention is typically administered parenterally in dosage unit formulations containing standard, well-known nontoxic physiologically acceptable carriers, adjuvants, and vehicles as desired. The term parenteral as used herein includes intravenous, intramuscular, subcutaneous, intradermal, intraarterial injection, or infusion techniques, as well as other conventional techniques or routes  
20 described above.

Injectable preparations, for example sterile injectable aqueous or oleaginous suspensions, are formulated according to the known art using suitable dispersing or wetting agents and suspending agents. The sterile injectable preparation can also be a sterile injectable solution or suspension in a nontoxic parenterally acceptable diluent or  
25 solvent, for example, as a solution in 1,3-butanediol.

Among the acceptable vehicles and solvents that may be employed are water, Ringer's solution, and isotonic sodium chloride solution. In addition, sterile, fixed oils are conventionally employed as a solvent or suspending medium. For this purpose any bland fixed oil is employed including synthetic mono- or di-glycerides. In addition, fatty acids  
30 such as oleic acid find use in the preparation of injectables.

Preferred carriers include neutral saline solutions buffered with phosphate, lactate, Tris, and the like. When administering viral vectors, the vector is purified sufficiently to render it essentially free of undesirable contaminants, such as defective

interfering adenovirus particles or endotoxins and other pyrogens such that it does not cause any untoward reactions in the individual receiving the vector construct. A preferred means of purifying the vector involves the use of buoyant density gradients, such as cesium chloride gradient centrifugation.

5           A carrier can also be a liposome. Means for using liposomes as delivery vehicles are well known in the art (*see, e.g.* Gabizon *et al.*, 1990; and Ranade, V. V., 1989).

          The immunogenic compositions of this invention also comprise a polynucleotide sequence of this invention operatively associated with a regulatory sequence that controls gene expression. The polynucleotide sequence of interest is engineered into an expression vector, such as a plasmid, under the control of regulatory elements which will promote expression of the DNA, that is, promoter and/or enhancer elements. In a preferred embodiment, the human cytomegalovirus immediate-early promoter/enhancer is used (U.S. Patent Number 5,168,062). The promoter may be cell specific and permit increased expression of the polynucleotide only in predetermined cells.

15           The polynucleotide is introduced directly into the host either as "naked" DNA (U.S. Patent Number 5,580,859) or formulated in compositions with agents which facilitate immunization, such as bupivacaine and other local anesthetics (U.S. Patent Number 6,127,170).

          In this polynucleotide immunization procedure, the polypeptides of the invention are expressed on a transient basis *in vivo*; no genetic material is inserted or integrated into the chromosomes of the host. This procedure is to be distinguished from gene therapy, where the goal is to insert or integrate the genetic material of interest into the chromosome. An assay is used to confirm that the polynucleotides administered by immunization do not rise to a transformed phenotype in the host (U.S. Patent Number 6,168,918).

## 25           H.       USES AND METHODS OF THE INVENTION

          The *Alloiococcus otitidis* polynucleotides, polypeptides, polypeptide homologues, modulators, adjuvants, and antibodies described in this invention are used in methods of treatment, diagnostic assays particularly in disease identification, drug screening assays and monitoring of effects during clinical trials. The isolated polynucleotides of the invention are used to express *Alloiococcus otitidis* polypeptides (*e.g., via* a recombinant expression vector in a host cell or in gene therapy applications) and to detect

*Alloiococcus otitidis* mRNA (e.g., in a biological sample). Moreover, the anti-*Alloiococcus otitidis* antibodies of the invention are used to detect and isolate an *Alloiococcus otitidis* polypeptide, particularly fragments of an *Alloiococcus otitidis* polypeptides present in a biological sample, and to modulate *Alloiococcus otitidis* polypeptide activity.

5           The invention provides immunogenic compositions comprising polypeptides having an amino acid sequence chosen from one or more of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof or a fragment thereof. The immunogenic composition may further comprise a pharmaceutically acceptable carrier, as outlined in section G.

10           In certain preferred embodiments, the immunogenic composition will comprise one or more adjuvants. As defined herein, an "adjuvant" is a substance that serves to enhance the immunogenicity of an "antigen" or the immunogenic compositions comprising a polypeptide antigens having an amino acid sequence chosen from one or more of even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO:  
15 6650. Thus, adjuvants are often given to boost the immune response and are well known to the skilled artisan. Preferred adjuvants to enhance effectiveness of the composition include, but are not limited to: (1) aluminum salts (alum), such as aluminum hydroxide, aluminum phosphate, aluminum sulfate, etc; (2) oil-in-water emulsion formulations (with or without other specific immunostimulating agents such as muramyl  
20 peptides (see below) or bacterial cell wall components), such as for example (a) MF59 (PCT Publ. No. WO90/14837), containing 5% Squalene, 0.5% Tween 80, and 0.5% Span 85 (optionally containing various amounts of MTP-PE (see below, although not required) formulated into submicron particles using a microfluidizer such as Model 110Y microfluidizer (Microfluidics, Newton, MA), (b) SAF, containing 10% Squalane, 0.4%  
25 Tween 80, 5% pluronic-blocked polymer L121, and thr-MDP (see below) either microfluidized into a submicron emulsion or vortexed to generate a larger particle size emulsion, and (c) Ribi™ adjuvant system (RAS), (Corixa, Hamilton, MT) containing 2% Squalene, 0.2% Tween 80, and one or more bacterial cell wall components from the group consisting of 3-O-deacylated monophosphorylipid A (MPL™) described in U.S.  
30 Patent No. 4,912,094 (Corixa), trehalose dimycolate (TDM), and cell wall skeleton (CWS), preferably MPL + CWS (Detox™), (3) saponin adjuvants, such as Quil A or STIMULON™ QS-21 (Antigenics, Framingham, MA) (U.S. Patent No. 5,057,540) may be used or particles generated therefrom such as ISCOMs (immunostimulating complexes);

(4) bacterial lipopolysaccharides, synthetic lipid A analogs such as aminoalkyl glucosamine phosphate compounds (AGP), or derivatives or analogs thereof, which are available from Corixa, and which are described in U.S. Patent Number 6,113,918; one such AGP is 2-[(R)-3-Tetradecanoyloxytetradecanoylamino]ethyl 2-Deoxy-4-O-phosphono-3-O-[(R)-3-tetradecanoyoxytetradecanoyl]-2-[(R)-3-tetradecanoyoxytetradecanoylamino]-b-D-glucopyranoside, which is also known as 529 (formerly known as RC529), which is formulated as an aqueous form or as a stable emulsion, synthetic polynucleotides such as oligonucleotides containing CpG motif(s) (U.S. Patent Number 6,207,646); (5) cytokines, such as interleukins (e.g., IL-1, IL-2, IL-4, IL-5, IL-6, IL-7, IL-12, IL-15, IL-18, *etc.*), interferons (e.g., gamma interferon), granulocyte macrophage colony stimulating factor (GM-CSF), macrophage colony stimulating factor (M-CSF), tumor necrosis factor (TNF), *etc.*; (6) detoxified mutants of a bacterial ADP-ribosylating toxin such as a cholera toxin (CT) either in a wild-type or mutant form, for example, wherein the glutamic acid at amino acid position is replaced by another amino acid, preferably a histidine, in accordance with published International patent Application number WO 00/18434, a pertussis toxin (PT, or an E. coli heat-labile toxin (LT), particularly LT-K63, LT-R72, CT-S109, PT-K9/G129; see, e.g., WO 93/13302 and WO 92/19265; and (7) other substances that act as immunostimulating agents to enhance the effectiveness of the composition.

As mentioned above, muramyl peptides include, but are not limited to, N-acetyl-muramyl-L-threonyl-D-isoglutamine (thr-MDP), N-acetyl-normuramyl-L-alanine-2-(1'-2' dipalmitoyl-*sn*-glycero-3-hydroxyphosphoryloxy)-ethylamine (MTP-PE), *etc.*

In another embodiment, the invention provides immunogenic compositions comprising a polynucleotide having a nucleotide sequence chosen from one or more of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, wherein the polynucleotide is comprised in a recombinant expression vector. Preferably the vector is plasmid DNA. The polynucleotide may further comprise heterologous nucleotides, *e.g.*, the polynucleotide is operatively linked to one or more gene expression regulatory elements, and further comprise one or more adjuvants. In a preferred embodiment, the immunogenic polynucleotide composition directs the expression of a neutralizing epitope of *Alloiococcus otitidis*.

Provided also are methods for immunizing a host against *Alloiococcus otitidis* infection. In a preferred embodiment, the host is human. Thus, a host or subject is

administered an immunogenic amount of an immunogenic composition comprising a polypeptide having an amino acid sequence chosen from one or more of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof or a fragment thereof and a pharmaceutically acceptable carrier. An  
5 immunogenic amount of an immunogenic composition is determined by doing a dose response study in which subjects are immunized with gradually increasing amounts of the immunogenic composition and the immune response analyzed to determine the optimal dosage. Starting points for the study is inferred from immunization data in animal models. The dosage amount can vary depending upon specific conditions of the  
10 individual. The amount can be determined in routine trials by means known to those skilled in the art.

An "immunologically effective amount" of the immunogenic composition in an appropriate number of doses is administered to the subject to elicit an immune response. "Immunologically effective amount", as used herein, means the administration of that  
15 amount to a mammalian host (preferably human), either in a single dose or as part of a series of doses, sufficient to at least cause the immune system of the individual treated to generate a response that reduces the clinical impact of the bacterial infection. Protection may be conferred by a single dose of the immunogenic composition, or may require the administration of several doses, in addition to booster doses at later times to  
20 maintain protection. This may range from a minimal decrease in bacterial burden to prevention of the infection. Ideally, the treated individuals will not exhibit the more serious clinical manifestations of the *Alloiococcus otitidis* infection. The dosage amount can vary depending upon specific conditions of the individual, such as age and weight. The amount can be determined in routine trials by means known to those skilled in the  
25 art.

#### **I. DIAGNOSTIC ASSAYS**

The invention provides methods for detecting the presence of an *Alloiococcus*  
30 *otitidis* polypeptide or *Alloiococcus otitidis* polynucleotide, or fragment thereof, in a biological sample. The method involves contacting the biological sample with a compound or an agent capable of detecting an *Alloiococcus otitidis* polypeptide or mRNA such that the presence of the *Alloiococcus otitidis* polypeptide/encoding nucleic acid molecule is detected in the biological sample. A preferred agent for detecting

*Alloiococcus otitidis* mRNA or DNA is a labeled or labelable oligonucleotide probe capable of hybridizing to *Alloiococcus otitidis* mRNA or DNA. The nucleic acid probe can be, for example, a full-length *Alloiococcus otitidis* polynucleotide of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, a  
5 complement thereof, or a fragment thereof, such as an oligonucleotide of at least 15, 30, 50, 100, 250 or 500 nucleotides in length and sufficient to specifically hybridize under stringent conditions to *Alloiococcus otitidis* mRNA or DNA. Alternatively, the sample can be contacted with an oligonucleotide primer of an *Alloiococcus otitidis* polynucleotide of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID No:  
10 6649, a complement thereof, or a fragment thereof, in the presence of nucleotides and a polymerase, under conditions permitting primer extension.

A preferred agent for detecting an *Alloiococcus otitidis* polypeptide is a labeled or labelable antibody capable of binding to an *Alloiococcus otitidis* polypeptide of one of the even numbered sequences set forth in SEQ. ID. NO.: 2 through SEQ. ID. NO. 6650.  
15 Antibodies can be polyclonal, or more preferably, monoclonal. An intact antibody, or a fragment thereof (*e.g.*, Fab or F(ab')<sub>2</sub>) can be used. The term "labeled or labelable," with regard to the probe or antibody, is intended to encompass direct labeling of the probe or antibody by coupling (*i.e.*, physically linking) a detectable substance to the probe or antibody, as well as indirect labeling of the probe or antibody by reactivity with another  
20 reagent that is directly labeled. Examples of indirect labeling include detection of a primary antibody using a fluorescently labeled secondary antibody and end-labeling of a DNA probe with biotin such that it are detected with fluorescently labeled streptavidin. The term "biological sample" is intended to include tissues, cells and biological fluids isolated from a subject, as well as tissues, cells and fluids present within a subject. That  
25 is, the detection method of the invention can be used to detect *Alloiococcus otitidis* mRNA, DNA or protein in a biological sample *in vitro* as well as *in vivo*. For example, *in vitro* techniques for detection of *Alloiococcus otitidis* mRNA include Northern hybridizations and *in situ* hybridizations. *In vitro* techniques for detection of *Alloiococcus otitidis* polypeptide include enzyme linked immunosorbent assays (ELISAs), Western  
30 blots, immunoprecipitations and immunofluorescence. Alternatively, *Alloiococcus otitidis* polypeptides can be detected *in vivo* in a subject by introducing into the subject a labeled anti-*Alloiococcus otitidis* antibody. For example, the antibody can be labeled with a



radioactive marker whose presence and location in a subject can be detected by standard imaging techniques.

The polynucleotides according to the invention may also be used in analytical DNA chips, which allow sequencing, the study of mutations and of the expression of genes, and which are currently of interest given their very small size and their high capacity in terms of number of analyses.

The principle of the operation of these chips is based on molecular probes, most often oligonucleotides, which are attached onto a miniaturized surface, generally of the order of a few square centimeters. During an analysis, a sample containing fragments of a target nucleic acid to be analyzed, for example DNA or RNA labeled, for example, after amplification, is deposited onto the DNA chip in which the support has been coated beforehand with probes. Bringing the labeled target sequences into contact with the probes leads to the formation, through hybridization, of a duplex according to the rule of pairing defined by J.D.Watson and F.Crick. After a washing step, analysis of the surface of the chip allows the effective hybridizations to be located by means of the signals emitted by the labels tagging the target. A hybridization fingerprint results from this analysis which, by appropriate computer processing, will make it possible to determine information such as the presence of specific fragments in the sample, the determination of sequences and the presence of mutations.

The chip consists of a multitude of molecular probes, precisely organized or arrayed on a solid support whose surface is miniaturized. It is at the center of a system where other elements (imaging system, microcomputer) allow the acquisition and interpretation of a hybridization fingerprint.

The hybridization supports are provided in the form of flat or porous surfaces (pierced with wells) composed of various materials. The choice of a support is determined by its physicochemical properties, or more precisely, by the relationship between the latter and the conditions under which the support will be placed during the synthesis or the attachment of the probes or during the use of the chip. It is therefore necessary, before considering the use of a particular support, to consider characteristics such as its stability to pH, its physical strength, its reactivity and its chemical stability as well as its capacity to nonspecifically bind nucleic acids. Materials such as glass, silicon and polymers are commonly used. Their surface is, in a first step, called "functionalization", made reactive towards the groups which it is desired to attach

thereon. After the functionalization, so-called spacer molecules are grafted onto the activated surface. Used as intermediates between the surface and the probe, these molecules of variable size render unimportant the surface properties of the supports, which often prove to be problematic for the synthesis or the attachment of the probes and for the hybridization.

Among the hybridization supports, there may be mentioned glass which is used, for example, in the method of *in situ* synthesis of oligonucleotides by photochemical addressing developed by the company Affymetrix (E.L. Sheldon, 1993), the glass surface being activated by silane. Genosensor Consortium (P. Mérel, 1994) also uses glass slides carrying wells 3 mm apart, this support being activated with epoxysilane.

The probes according to the invention may be synthesized directly *in situ* on the supports of the DNA chips. This *in situ* synthesis may be carried out by photochemical addressing (developed by the company Affymax (Amsterdam, Holland) and exploited industrially by its subsidiary Affymetrix (United States)) or based on the VLSIPS (very large scale immobilized polymer synthesis) technology (S.P.A. Fodor *et al.*, 1991) which is based on a method of photochemically directed combinatorial synthesis and the principle of which combines solid-phase chemistry, the use of photolabile protecting groups and photolithography.

The probes according to the invention may be attached to the DNA chips in various ways such as electrochemical addressing, automated addressing or the use of probe printers (T. Livache *et al.*, 1994; G. Yershov *et al.*, 1996; and J. Derisi *et al.*, 1996)

The revealing of the hybridization between the probes of the invention, deposited or synthesized *in situ* on the supports of the DNA chips, and the sample to be analyzed, may be determined, for example, by measurement of fluorescent signals, by radioactive counting or by electronic detection.

The use of fluorescent molecules such as fluorescein constitutes the most common method of labeling the samples. It allows direct or indirect revealing of the hybridization and allows the use of various fluorochromes.

Affymetrix currently provides an apparatus or a scanner designed to read its Gene Chip™ chips. It makes it possible to detect the hybridizations by scanning the surface of the chip in confocal microscopy (R.J. Lipshutz *et al.*, 1995).

The nucleotide sequences according to the invention are also used in DNA chips to carry out the analysis of the expression of the *Alloioococcus otitidis* genes. This

analysis of the expression of *Alloioococcus otitidis* genes is based on the use of chips where probes of the invention, chosen for their specificity to characterize a given gene, are present (D.J. Lockhart *et al.*, 1996; D.D. Shoemaker *et al.*, 1996). For the methods of analysis of gene expression using the DNA chips, reference may, for example, be made to the methods described by D.J. Lockhart *et al.* (1996) and Sosnowsky *et al.* (1997) for the synthesis of probes *in situ* or for the addressing and the attachment of previously synthesized probes. The target sequences to be analyzed are labeled and in general fragmented into sequences of about 50 to 100 nucleotides before being hybridized onto the chip. After washing as described, for example, by D.J. Lockhart *et al.* (1996) and application of different electric fields (Sosnowsky *et al.*, 1997), the labeled compounds are detected and quantified, the hybridizations being carried out at least in duplicate. Comparative analyses of the signal intensities obtained with respect to the same probe for different samples and/or for different probes with the same sample, determine the differential expression of RNA or of DNA derived from the sample.

The nucleotide sequences according to the invention are, in addition, used in DNA chips where other nucleotide probes specific for other microorganisms are also present, and allow the carrying out of a serial test allowing rapid identification of the presence of a microorganism in a sample.

Accordingly, the subject of the invention is also the nucleotide sequences according to the invention, characterized in that they are immobilized on a support of a DNA chip.

The DNA chips, characterized in that they contain at least one nucleotide sequence according to the invention, immobilized on the support of the said chip, also form part of the invention.

The chips preferably contain several probes or nucleotide sequences of the invention of different length and/or corresponding to different genes so as to identify, with greater certainty, the specificity of the target sequences or the desired mutation in the sample to be analyzed.

Accordingly, the analyses carried out by means of primers and/or probes according to the invention, immobilized on supports such as DNA chips, make it possible, for example, to identify, in samples, mutations linked to variations such as intraspecies variations. These variations may be correlated or associated with pathologies specific to the variant identified and make it possible to select the

appropriate treatment.

The invention thus comprises a DNA chip according to the invention, characterized in that it contains, in addition, at least one nucleotide sequence of a microorganism different from *Alloiococcus otitidis*, immobilized on the support of the said chip; preferably, the different microorganism is chosen from an associated  
5 microorganism, a bacterium of the *Streptococcus* family, and a variant of the species *Alloiococcus otitidis*.

The principle of the DNA chip as explained above, is also used to produce protein “chips” on which the support has been coated with a polypeptide or an antibody  
10 according to the invention, or arrays thereof, in place of the DNA. These protein “chips” make it possible, for example, to analyze the biomolecular interactions (BIA) induced by the affinity capture of target analytes onto a support coated, for example, with proteins, by surface plasma resonance (SPR). Reference may be made, for example, to the techniques for coupling proteins onto a solid support which are described in EP 524 800  
15 or to the methods describing the use of biosensor-type protein chips such as the BIAcore-type technique (Pharmacia) (Arlinghaus *et al.*, 1997 and Krone *et al.*, 1997). These polypeptides or antibodies according to the invention, capable of specifically binding antibodies or polypeptides derived from the sample to be analyzed, are thus used in protein chips for the detection and/or the identification of proteins in samples.  
20 The said protein chips may in particular be used for infectious diagnosis and preferably contain, per chip, several polypeptides and/or antibodies of the invention of different specificity, and/or polypeptides and/or antibodies capable of recognizing microorganisms different from *Alloiococcus otitidis*.

Accordingly, the present invention also encompasses polypeptides and the  
25 antibodies according to the invention, characterized in that they are immobilized on a support, in particular, on a protein chip.

The protein chips, characterized in that they contain at least one polypeptide or one antibody according to the invention immobilized on the support of the said chip, also form part of the invention.

30 The invention comprises, in addition, a protein chip according to the invention, characterized in that it contains, in addition, at least one polypeptide of a microorganism different from *Alloiococcus otitidis* or at least one antibody directed against a compound of a microorganism different from *Alloiococcus otitidis*, immobilized on the support of the

chip.

The invention also relates to a kit or set for the detection and/or the identification of bacteria belonging to the species *Alloiococcus otitidis* or to an associated microorganism, or for the detection and/or the identification of a microorganism characterized in that it comprises a protein chip according to the invention.

The present invention also provides a method for the detection and/or the identification of bacteria belonging to the species *Alloiococcus otitidis* or to an associated microorganism in a biological sample, characterized in that it uses a nucleotide sequence according to the invention.

The invention also encompasses kits for detecting the presence of an *Alloiococcus otitidis* polypeptide in a biological sample. For example, the kit comprises reagents such as a labeled or labelable compound or agent capable of detecting *Alloiococcus otitidis* polypeptide or mRNA in a biological sample; means for determining the amount of *Alloiococcus otitidis* polypeptide in the sample; and means for comparing the amount of *Alloiococcus otitidis* polypeptide in the sample with a standard. The compound or agent is packaged in a suitable container. The kit further comprises instructions for using the kit to detect *Alloiococcus otitidis* mRNA or protein.

In certain embodiments, detection involves the use of a probe/primer in a polymerase chain reaction (PCR) (*see, e.g.* U.S. 4,683,195 and U.S. 4,683,202), such as anchor PCR or RACE PCR, or, alternatively, in a ligation chain reaction (LCR). This method includes the steps of collecting a sample of cells from a patient, isolating nucleic acid (*e.g.*, genomic, mRNA or both) from the cells of the sample, contacting the nucleic acid sample with one or more primers which specifically hybridize to an *Alloiococcus otitidis* polynucleotide under conditions such that hybridization and amplification of the *Alloiococcus otitidis*-polynucleotide (if present) occurs, and detecting the presence or absence of an amplification product, or detecting the size of the amplification product and comparing the length to a control sample.

#### **J. TRANSGENIC ANIMALS**

It is contemplated that in some instances the genome of a transgenic animal of the present invention will have been altered through the stable introduction of one or more of the *Alloiococcus otitidis* polynucleotide compositions described herein, either native, synthetically modified or mutated. As described herein, a "transgenic animal"

refers to any non-human animal, preferably a non-human mammal (*e.g.* mouse, rat, rabbit, squirrel, hamster, rabbits, guinea pigs, pigs, micro-pigs, prairie, baboons, squirrel monkeys and chimpanzees, *etc.*), bird or an amphibian, in which one or more cells contain a heterologous nucleic acid sequence introduced by way of human intervention, such as by transgenic techniques well known in the art. The nucleic acid is introduced into the cell, directly or indirectly, by introduction into a precursor of the cell, by way of deliberate genetic manipulation, such as by microinjection or by infection with a recombinant virus. The term genetic manipulation does not include classical crossbreeding, or *in vitro* fertilization, but rather is directed to the introduction of a recombinant DNA molecule. This molecule may be integrated within a chromosome, or it may be extrachromosomally replicating DNA.

The host cells of the invention are also used to produce non-human transgenic animals. The non-human transgenic animals are used in screening assays designed to identify infections or compounds, *e.g.*, drugs, pharmaceuticals, *etc.*, which are capable of ameliorating *Alloiococcus otitidis* symptoms or infections. For example, in one embodiment, a host cell of the invention is a fertilized oocyte or an embryonic stem cell into which an *Alloiococcus otitidis* polypeptide-coding sequence has been introduced. Such host cells are then used to create non-human transgenic animals in which exogenous *Alloiococcus otitidis* gene sequences have been introduced into their genome or homologous recombinant animals in which endogenous *Alloiococcus otitidis* gene sequences have been altered. Such animals are useful for studying the effects of an *Alloiococcus otitidis* polypeptide and for identifying and/or evaluating modulators of *Alloiococcus otitidis* polypeptide infectivity.

A transgenic animal of the invention is created by introducing an *Alloiococcus otitidis* polypeptide-encoding nucleic acid sequence into the male pronuclei of a fertilized oocyte, *e.g.*, by microinjection, retroviral infection, and allowing the oocyte to develop in a pseudopregnant female foster animal. The human *Alloiococcus otitidis* cDNA sequence of one or more of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649 can be introduced as a transgene into the genome of a non-human animal.

Moreover, a non-*Alloiococcus otitidis* homologue of the *Alloiococcus otitidis* gene can be isolated based on hybridization to the *Alloiococcus otitidis* cDNA (described above) and used as a transgene. Intronic sequences and polyadenylation signals can

also be included in the transgene to increase the efficiency of expression of the transgene. A tissue-specific regulatory sequence(s) can be operably linked to the *Alloiococcus otitidis* transgene to direct expression of an *Alloiococcus otitidis* polypeptide to particular cells. Methods for generating transgenic animals *via* embryo manipulation and microinjection, particularly animals such as mice, have become conventional in the art and are described, for example, in U.S. 4,736,866 and 4,870, 009, U.S. 4,873,191 and in Hogan, 1986. Similar methods are used for production of other transgenic animals. A transgenic founder animal can be identified based upon the presence of the *Alloiococcus otitidis* transgene in its genome and/or expression of *Alloiococcus otitidis* mRNA in tissues or cells of the animals. A transgenic founder animal can then be used to breed additional animals carrying the transgene. Moreover, transgenic animals carrying a transgene encoding an *Alloiococcus otitidis* polypeptide can further be bred to other transgenic animals carrying other transgenes.

In another embodiment, transgenic non-human animals can be produced which contain selected systems that allow for regulated expression of the transgene. One example of such a system is the cre/loxP recombinase system of bacteriophage PL. For a description of the cre/loxP recombinase system, *see, e.g.*, Lakso *et al.*, 1992. Another example of a recombinase system is the FLP recombinase system of *Saccharomyces cerevisiae* (O'Gonnan *et al.*, 1991). If a cre/loxP recombinase system is used to regulate expression of the transgene, animals containing transgenes encoding both the Cre recombinase and a selected protein are required. Such animals can be provided through the construction of "double" transgenic animals, *e.g.*, by mating two transgenic animals, one containing a transgene encoding a selected protein and the other containing a transgene encoding a recombinase.

Clones of the non-human transgenic animals described herein can also be produced according to the methods described in Wilmut *et al.*, 1997, and PCT International Publication Nos. WO 97/07668 and WO 97/07669. In brief, a cell, *e.g.*, a somatic cell, from the transgenic animal can be isolated and induced to exit the growth cycle and enter G<sub>0</sub> phase. The quiescent cell can then be fused, *e.g.*, through the use of electrical pulses, to an enucleated oocyte from an animal of the same species from which the quiescent cell is isolated. The reconstructed oocyte is then cultured such that it develops to morula or blastocyst and then transferred to pseudopregnant female foster

animal. The offspring borne of this female foster animal will be a clone of the animal from which the cell, *e.g.*, the somatic cell, is isolated.

All patents and publications cited herein are hereby incorporated by reference.

## 5 K. Examples

The following examples are carried out using standard techniques, which are well known and routine to those of skill in the art, except where otherwise described in detail. The following examples are presented for illustrative purposes only, and should not be  
10 construed in any way limiting the scope of this invention.

### EXAMPLE 1

#### CONFIRMATION OF THE IDENTITY OF THE *ALLOIOCOCCUS OTITIDIS* 1104-92 ISOLATE

15 An *Alloiococcus otitidis* isolate designated 1104-92 was obtained from Dr. Richard Facklam of the Centers for Disease Control and Prevention in Atlanta. It was isolated from the middle ear fluid of a child in the Atlanta, Georgia area. It was confirmed to be *Alloiococcus otitidis* by comparing it to the type strain, ATCC51267, obtained from the American Type Culture Collection (Aguirre, 1992 #1). Both the 1104-92 isolate and  
20 the type strain were characterized as Gram positive cocci. Both grow on Columbia agar supplemented with 5% yeast extract, 0.5% polysorbate 80 (Tween 80), and 0.7% phosphatidyl choline when incubated at 37°C. On this medium, both strains form slow growing small white colonies that require nearly two days to be easily observed with the naked eye. Both are sensitive to lysis by hen egg white lysozyme and *Streptococcus*  
25 *globisporus* mutanolysin. Both grow in the presence of 2% sodium azide. Both are killed by incubation at 55°C for 30 minutes. The 1104-92 isolate was subjected to polymerase chain reaction (PCR) identification based on its 16s rRNA gene. This was done using two of the primers specified by Aguirre and Collins (Aguirre, 1992 #2). The antisense primer used was ATCTTCCTGCTTGCAGGAAGAGG (Seq. ID No.: 6653) and the sense  
30 primer was ACGCTTCATCTCTGAAGCTAGC (Seq. ID No.6652). PCR confirmed that the 1104-92 isolate was a strain of *Alloiococcus otitidis*. Thus by multiple criteria, the 1104-92 strain was confirmed to be an isolate of *Alloiococcus otitidis*.



**EXAMPLE 2****STORAGE, GROWTH, AND HARVEST OF *ALLOIOCOCCUS OTITIDIS* 1104-92 ISOLATE FOR THE ISOLATION OF DNA**

5           The *Alloiococcus otitidis* isolate 1104-92 was stored at  $-70^{\circ}\text{C}$  in Todd-Hewlett broth containing 40% glycerol. A small portion of the frozen stock was streaked onto the agar medium described in Example 1 and incubated at  $37^{\circ}\text{C}$  for two days. The growth from the plate was swabbed into a  $17 \times 100\text{cm}$  tube containing 6 ml of a serum-free broth medium. This broth medium was prepared with 30g Todd-Hewlett medium, 5 g  
10 yeast extract, 10 ml polysorbate 80 (Tween 80), and 1 liter distilled water. This medium was sterilized by autoclaving for 35 minutes. The bacteria were incubated aerobically without shaking in an aerobic incubator at  $37^{\circ}\text{C}$  for two days. The tube containing the growing bacteria was then shaken to resuspend the bacteria and added to a liter of the same medium in a Fernbach flask. This flask, in turn, was incubated aerobically for three  
15 days without shaking. The bacteria were harvested by first swirling the flask to suspend the bacteria and then low speed centrifugation at about  $5,000 \times g$  for 30 minutes. The pellet of bacteria was washed by resuspending it in 10 to 15 mL of phosphate buffered saline (PBS), and centrifuging the suspension at about  $8,000 \times g$  for 20 minutes. The pellet of bacteria was retained and stored frozen at  $-20^{\circ}\text{C}$ . The yield of wet bacterial  
20 pellet was typically about 1 g per liter of broth.

**EXAMPLE 3****PREPARATION OF *ALLOIOCOCCUS OTITIDIS* GENOMIC DNA**

25           To prepare genomic DNA, 0.95 g frozen pellet of bacteria was defrosted and suspended in 10 mL of PBS containing 1 mM  $\text{MgCl}_2$ . The bacteria were killed by incubating the suspension at  $55^{\circ}\text{C}$  for 20 minutes. The suspension was allowed to cool before adding 25  $\mu\text{l}$  of a 10 mg/mL stock of hen egg white lysozyme and 50  $\mu\text{l}$  of a 25,000 unit/mL stock of *Streptococcus globisporus* mutanolysin to the suspension. It was  
30 then incubated for one hour at  $37^{\circ}\text{C}$ . Then 50  $\mu\text{l}$  of a 10 mg/mL stock of RNase was added and the suspension incubated an additional hour at  $37^{\circ}\text{C}$ . After these incubations, sodium dodecylsulfate (SDS) was added to a final concentration of 0.3% (0.3 mL of a 10% stock). This was followed by the addition of 0.3 mL of a 1 mg/mL stock of proteinase K. The suspension was then incubated for two hours at  $37^{\circ}\text{C}$ . After this time,

an equal volume of water saturated phenol/chloroform/isopropyl (25:24:1) was added to the digested suspension and gently mixed. The upper aqueous layer was retained after a low speed centrifugation and 2.5 volumes of ethanol were added and the tube gently inverted to mix. The DNA was then spooled out on a glass rod and allowed to air dry.

5       The DNA at this stage still contained obvious impurities and needed further purification. The DNA dried on the glass rod was soaked in 70% ethanol to remove excess phenol and air-dried once again. It was then suspended in 2 ml of Tris-EDTA buffer to which 2  $\mu$ l of RNase cocktail was added and incubated at room temperature for 75 minutes. Then 100  $\mu$ l of protease, 100  $\mu$ l SDS and 40  $\mu$ l of 100 mM  $\text{CaCl}_2$  were  
10       added and the suspension incubated for 3.5 hours. An equal volume of chloroform was added, gently mixed, and then centrifuged at a low speed. The aqueous layer was collected and re-extracted with the phenol, chloroform, and isopropyl alcohol reagent. In turn, the aqueous layer was extracted with chloroform. At this point, 3 M sodium acetate was added to the aqueous phase collected from the last extraction and then 3.75 ml of  
15       ethanol was added and gently mixed. The DNA was spooled out, soaked in 70% ethanol and allowed to air-dry. The DNA was finally suspended in 2 ml of Tris-EDTA buffer. Based on absorption at 260 nm, the final yield of DNA was 482  $\mu$ g of DNA. The DNA was confirmed to be that of *Alloiococcus otitidis* by the PCR method described in example 1. This DNA was submitted for sequencing. The sequences of all the ORFs  
20       were obtained as described in Examples 4 and 5 below, and are set forth in odd numbered sequence listings, Seq. ID No. 1 through Seq. ID No. 6649. The sequence of the entire *Alloiococcus otitidis* genome is set forth in Seq. ID No: 6651.

#### EXAMPLE 4.

##### 25       CLONING AND SEQUENCING OF THE ALLOIOCOCCUS OTITIDIS GENOME

This invention provides nucleotide sequences of the genome of *Alloiococcus otitidis*, which thus comprises a DNA sequence library of *Alloiococcus otitidis* genomic DNA. The description that follows provides nucleotide sequences of *Alloiococcus*  
30       *otitidis*, and also describes how the sequences were obtained and how ORFs (Open Reading Frames) and protein-coding sequences were identified.

To construct a library, genomic DNA was hydrodynamically sheared in an HPLC and then separated on a standard 1% agarose gel. A fraction corresponding to 3000-

3500 bp in length was excised from the gel and purified by the GeneClean™ procedure (BIO101, Inc.).

The purified DNA fragments were then blunt-ended using T4 DNA polymerase. The blunt-ended DNA was then ligated to unique BstX1-linker adapters. These linkers are complementary to the pGTC vector, while the overhang is not self-complementary. Therefore, the linkers will not concatamerize nor will the cut-vector religate itself easily. The linker-adapted inserts were separated from the unincorporated linkers on a 1% agarose gel and again purified using GeneClean. The linker-adapted inserts were then ligated to BstX1-cut vector to construct "shotgun" subclone libraries.

Only major modifications to the standard protocols are highlighted. Briefly, the library was transformed into DH10B competent cells (Gibco/BRL, DH5a transformation protocol). Transformed cells were detected by plating onto antibiotic plates containing ampicillin. The plates were incubated overnight at 37° C. Transformant clones were then selected for sequencing. The cultures were grown overnight at 37°C. DNA was purified using a silica bead DNA preparation (Egelstein, 1996) method. In this manner, 25 mg of DNA was obtained per clone.

These purified DNA samples were then sequenced using ABI dye-terminator chemistry. All subsequent steps were based on sequencing by automated DNA sequencing methods. The ABI dye terminator sequence reads were run on MegaBace™ 10000 (Amersham) machines and the data transferred to UNIX based computers. Base calls and quality scores were determined using the PHRED software program (Ewing et al., 1998, Genome Res. 8: 175-185; Ewing and Green, 1998, Genome Res. 8:685-734). Reads were assembled using PHRAP (P. Green, Abstracts of DOE Human Genome Program Contractor-Grantee Workshop V, Jan. 1996, p 157) with default program parameters and quality scores.

To identify *Alloiococcus otitidis* genome encoded polypeptides, the complete genomic sequence of *Alloiococcus otitidis* was analyzed essentially as follows: First, all possible stop-to-stop open reading frames (ORFs) greater than or equal to 222 nucleotides in all three reading frames were translated into amino acid sequences.

Second, the identified ORFs were analyzed for homology to known protein sequences. Third, the coding potential of non-homologous sequences was evaluated with the GeneMark™ software program (Borodovsky and McIninch, 1993, Comp. Chem. 17:123).

**EXAMPLE 5.****BIOINFORMATICS AND GENE MINING OF *ALLOIOCOCCUS OTITIDIS***

5           The genomic sequence of *Alloiococcus otitidis* was examined for suitable open reading frames. ORFs were determined in the following manner. An ORF was defined as having one of three potential start site codons, ATG, GTG, or TTG and one of three potential stop codons, TAA, TAG, TGA. The Applicants used a unique set of three ORF finder algorithms: GLIMMER™ (Salzberg *et al.*, 1998), GeneMark™ (Lukashin and  
10   Borodovsky, 1998) and Applicants' assignee's own program to enhance the efficiency for finding "all" ORFs. In order to evaluate the accuracy of the ORFs determined, a program developed by Applicants' assignee called DiCTion was employed that uses a discrete mathematical cosine function to assign a score for each ORF. An ORF with a DiCTion score >1.5 was considered to have a high probability of encoding a protein product. The  
15   minimum length of an ORF predicted by the three ORF finders was set to 225 nucleotides (including stop codon) which would encode a protein of 74 amino acids. An in-house graphical analysis program developed by Applicants' assignee also allowed the Applicants to see all six reading frames and the location of the predicted ORFs relative to the genomic sequence. This helped to eliminate those ORFs that have large overlaps  
20   with other ORFs, although there are known cases of ORFs being totally embedded within other ORFs (Loessner *et al.*, 1999; Hernandez-Sanchez *et al.*, 1998).

          The initial annotation of the *Alloiococcus otitidis* ORFs was performed using the BLAST (v. 2.0) Gapped search algorithm, BlastP, to identify homologous sequences (Altschul *et al.*, 1997). A cutoff 'e' value of anything  $<e^{-10}$  was considered significant.  
25   Other search algorithms such as FASTA or PSI-BLAST were used as needed. The non-redundant protein sequence database used for the homology searches consisted of GenBank, SWISS-PROT, PIR, and TREMBL database sequences. ORFs with a BlastP result of  $>e^{-10}$  were considered to be unique to *Alloiococcus otitidis*.

          A keyword search of the entire BLAST results was carried out using known or  
30   suspected target genes (those that encode polypeptide candidates for inclusion in immunogenic compositions) as well as words that identified the location of a protein or function.

          Several parameters are used to determine partitioning of the predicted proteins. Proteins destined for translocation across the cytoplasmic membrane encode a leader

signal (also called signal sequence) composed of a central hydrophobic region flanked at the N-terminus by positively charged residues (Pugsley, 1993). A program called SignalP identifies signal peptides and their cleavage sites (Nielsen *et al.*, 1997). To predict protein localization in bacteria, the software PSORT has been used (Nakai and Kanehisa, 1991). This program uses a neural net algorithm to predict localization of proteins to the 'cytoplasm', 'periplasm', and 'cytoplasmic membrane' for Gram-positive bacteria as well as 'outer membrane' for Gram-negative bacteria. Transmembrane (TM) domains of proteins have been detected using the software program TopPred2 (Cserzo *et al.*, 1997).

The Hidden Markov Model (HMM) Pfam database of multiple alignments of protein domains or conserved protein regions (Sonnhammer *et al.*, 1997) was used to identify *Alloicoccus otitidis* proteins that may belong to an existing protein family. Keyword searching of this output was used to help identify additional candidate polypeptides that may have been missed by the BLAST search criteria. Additional HMM models were developed by Applicants' assignee. A computer algorithm, called HMM Lipo, was developed internally to predict lipoproteins using 131 biologically proven bacterial lipoproteins. This training set was generated from experimentally proven prokaryotic lipoproteins. The protein sequence from the start of the protein to the cysteine amino acid plus the next two additional amino acids was used to generate the HMM. Using approximately 70 known prokaryotic proteins containing the LPXTG cell wall sorting signal, a HMM (Eddy, 1996), was developed to predict cell wall proteins that are anchored to the peptidoglycan layer (Mazmanian *et al.*, 1999; Navarre and Schneewind, 1999). The model used not only the LPXTG sequence, but also included two features of the downstream sequence, the hydrophobic transmembrane domain and the positively charged carboxy terminus. There are also a number of proteins that interact, non-covalently, with the peptidoglycan layer and are distinct from the LPXTG protein class described above. These proteins seem to have a consensus sequence at their carboxy terminus (Koebnik, 1995). The Applicants also have developed and used a HMM of this region to identify any *Alloicoccus otitidis* that may fall into this class of proteins.

The proteins encoded by *Alloicoccus otitidis* identified ORFs were also evaluated for other useful characteristics. A tandem repeat finder (Benson, 1999) identified ORFs containing repeated DNA sequences such as those found in

MSCRAMMs (Foster and Hook, 1998) and phase variable surface proteins of *Neisseria meningitidis* (Parkhill *et al.*, 2000). Proteins that contain the Arg-Gly-Asp (RGD) attachment motif, together with integrins that serve as their receptor, constitute a major recognition system for cell adhesion. RGD recognition is one mechanism used by  
5 microbes to gain entry into eukaryotic tissues (Stockbauer *et al.*, 1999; Isberg and Tran Van Nhieu, 1994). However, not all RGD containing proteins mediate cell attachment. It has been shown that RGD-containing peptides with a proline at the carboxy end (RGDP) are inactive in cell attachment assays (Pierschbacher and Ruoslahti, 1987) and were excluded from consideration. The Geanfammer software was used to cluster proteins  
10 into homologous families (Park and Teichmann, 1998). Preliminary analysis of the family classes has provided novel ORFs within a polypeptide candidate cluster, as well as defining potential protein function.

#### EXAMPLE 6

15

#### PROTEOMICS

Two strategies for identifying surface exposed proteins on microorganisms are used to identify surface exposed proteins on *Alloioococcus otitidis*. The first involves digesting of the surface of live organisms with protease and analyzing the released  
20 proteins. The second involves the purification of cellular membrane in a way that preserves the interaction of proteins that normally associate with the membrane. Both techniques revolve around the use of mass spectroscopy to identify the proteins that are detected but otherwise differ substantially.

In the first strategy, cells are treated with proteolytic enzymes in isotonic solution  
25 without substantial cell lysis. Experimentally, the cells are washed and suspended in an isotonic glycerol solution of neutral pH. A reductant, dithiothreitol, is first added to cleave the protein disulfide linkages and then iodoacetamide is added to alkylate the exposed cysteine thiols. The objective of this step is to break up the secondary and tertiary structure of the surface proteins. Porcine trypsin is then added and the cells are  
30 incubated at 37°C for 4 to 24 hours. The cells are then spun down and the supernatant containing the digest of surface exposed proteins is analyzed by mass spectroscopy (vide infra). At the end of the procedure, cell integrity is observed by Scanning Electron Microscopy (SEM). Cells, so treated, have a strikingly different morphology, as seen

under the SEM, which is best described as a “clean shave”. That is, the normal spongy or furry appearance is replaced by a smooth spherical morphology. Maintaining cell integrity throughout this operation is important. The intact cell membrane protects all intracellular proteins from the proteolytic step required for identification. Any ruptured  
5 cells therefore spill intracellular proteins into the extracellular environment where they are digested and erroneously identified as surface exposed proteins.

In the second strategy, proteins with a natural tropism for membranes are copurified with membranes by simple centrifugation. In principle, this separates proteins into two classes; soluble and membrane bound. In this case, the class of interest is  
10 membrane bound because many of these are also surface exposed as well. Experimentally, cells are ruptured in the absence of detergent by sonication or shear and the lysate is subjected to differential centrifugation. The pellet from a high speed spin (20,000 x g) consists of membranes and their associated proteins. This pellet is then dissolved in SDS load buffer and then separated by SDS PAGE. The gel, after staining,  
15 shows a large number of still intact proteins that share the quality of being membrane bound. The protein bands from this gel are then cut and exposed to trypsin for the obligate digestion before mass spectroscopic identification.

It should be pointed out that many of these proteins are actually on the inside (cytoplasmic) surface of the membrane and may well have no surface exposure at all.  
20 There are several advantages to this method, however, that offset this apparent lack of selectivity. Many proteins are not apprehended by the aforementioned technique of surface digestion are, however, captured by membrane enrichment. Surface digestion fails for proteins that are minimally exposed to the protease. This would be the case for proteins that are highly structured, membrane buried, or heavily glycosylated. In the final  
25 analysis both techniques have different merits and shortcomings and can be used in a complementary way.

In a typical example, a membrane preparation was dissolved in SDS load buffer and the proteins separated by SDS PAGE. After staining with colloidal Coomassie Blue stain, fifteen gel bands containing the entire sample lane were excised and the bands  
30 digested individually with trypsin. The tryptic peptides were analyzed using microcapillary reversed-phase liquid chromatography – nano-electrospray tandem mass spectrometry (LC-MS/MS) on a Finnigan LCQ Deca quadrupole ion trap mass spectrometer. Acquisition was performed using a “3 CADs experiment”. Using SEQUEST software, the

uninterpreted tandem mass spectrometric information was used to search appropriate sequence databases to identify the proteins present in each gel band.

#### EXAMPLE 7

#### PROTEIN IDENTIFICATION

5  
10 In order to identify the polypeptide components in the complex surface digest mixture, an analytical technique is used to separate and sequence multiple peptides with high sensitivity over a large concentration range. Tandem mass spectrometry (MS/MS) has been shown to be a powerful approach to analyze proteins from both gels and in solution. MS/MS first uses a mass analyzer to separate a peptide ion from a mixture of ions, then uses a second step or mass analyzer to activate and dissociate the ion of interest. This process, known as collision induced dissociation (CID) causes the peptide to fragment at the peptide bonds between the amino acids, and therefore, the  
15 fragmentation pattern of a peptide can be used to determine its amino acid sequence. In addition, the SEQUEST computer algorithm can be used to search the experimental fragmentation spectrum directly against protein or translated nucleic acid sequence databases. For peptides above roughly 800-900 Da in size, a single spectrum can uniquely identify a protein.

20 To sequence multiple peptides from a complex mixture, a reversed phase chromatography system is coupled to an electrospray ion trap mass spectrometer. In this system, it is known that high sensitivity (down to sub-femtomole levels) is attained by minimizing both flow rate and column diameter to concentrate the elution volume and direct as much of the column effluent as possible into the orifice of the mass  
25 spectrometer detector. Initial experiments separated peptides using a reversed phase gradient of 1% acetonitrile/minute. In order to increase chromatographic separation, longer gradients, down to 0.28% acetonitrile/minute, and slower flow rates (50 nL/min) will be employed. To maximize the coverage of proteins present in the sample, the data-dependent acquisition feature of the ion trap is employed. The instrument is  
30 programmed to acquire a single ms scan in the range of m/z 375-600, then to obtain ms/ms data on the top two ions in that range. It then acquires another ms scan in the range of m/z 600-1000, and obtains ms/ms data on the top two ions in that range. This results in better coverage of the larger peptides.



Dynamic exclusion is used to prevent reacquisition of tandem mass spectra of ions once a spectrum had been acquired for a particular  $m/z$  value. The isotopic exclusion function excludes the ion associated with the  $^{13}\text{C}$  isotope of peptides from the list of ions slated for MS/MS. A 3- $\mu$  mass width window is selected for this purpose.

- 5 Using these data-dependent features dramatically increases the number of peptide ions that will be selected for CID analysis.

#### EXAMPLE 8

##### SEQUEST ANALYSIS

- 10 The LC-MS/MS data acquisition conditions described above typically results in fragmentation data for more than 2000 peptide ions for each run. Using the Sequest algorithm, this data is searched against a composite protein sequence database containing the translated ORFs from *Alloiococcus otitidis* combined with the non-
- 15 redundant protein sequence database OWL. Sequest search conditions using a modified trypsin selectivity allows a differential search of +16 Da on methionine (to account for met oxidation). Candidate matches identified by Sequest are confirmed using the following manual procedure. Those matches with Xcorr values greater than 2.5 (a measure of the similarity of the experimental ms/ms data to that generated from the
- 20 sequence database), and delCn values greater than 0.1 (delCn measures the normalized difference between the Xcorr values of the first and second matches), are chosen for further analysis. The fragmentation spectra from good matches are checked for reasonable signal/noise, and the list of matched ions are examined for reasonable continuity. Some matches that are not acceptable alone are only included if other
- 25 confirmatory ms/ms data is generated by the same sample.

#### EXAMPLE 9

##### CLONING AND PROTEIN EXPRESSION

- 30 Primer sets are designed for PCR amplification of desired ORFs such that the forward 5' primer anneals at the start of the predicted mature protein. For lipoproteins, the 5' forward primer is designed to anneal just after the codon encoding a cysteine residue of the mature protein to minimize disulfide bridging. Design of the opposing reverse 3' primers independent upon the type of predicted protein. For those proteins

that contain an LPXTG, the primer is designed such that it anneals at the beginning (5' end) of the cell wall anchor region. For all other predicted proteins, primers are redesigned such that they anneal at the 3' end of the ORF. Additionally, the 5'-forward primer is initially designed to allow an in-frame fusion to thioredoxin with the opposing 3'-reverse primer allowing read-through to include a downstream his-patch and V5 epitope (pBAD/thio-TOPO<sup>®</sup>, Invitrogen, Carlsbad, CA). In parallel, these same PCR products are cloned into pCR<sup>®</sup>T7TOPO<sup>®</sup> (Invitrogen, Carlsbad, CA). This allows for an N-terminal fusion to a Xpress epitope and a his-tag for purification.

All PCR reactions are performed using *Alloiococcus otitidis* chromosomal DNA as the template. PCR products are transformed into the *E. coli* host, TOP10, and plated on SOB containing 100 µg/mL ampicillin. Colonies are screened by PCR amplification using a vector specific 5' primer and the specific 3' reverse primer annealing to the gene insert. Colonies are seeded into wells of 96 well microtiter plates containing 50 µ L 50% glycerol. Ten-12 colonies per gene are seeded in one row of the plate. In a second 96 well PCR plate, 50 µ L reactions are set up specific to the gene of interest. One µ L of the cells suspended in glycerol is used as template in the PCR reaction. Reactions that produce bands of the expected size are analyzed further. The cells that are seeded in 50% glycerol have SOB media added to them and incubated at 37° C for 5-8 hours and frozen at -70° C.

PCR positive colonies are inoculated into 2 mL cultures for overnight growth. Part of the culture is used to prepare plasmid DNA that is then analyzed by restriction digestion to confirm the inserts while another part is used to seed 10 mL expression cultures (for pBAD plasmids) for expression. Mid-log phase cultures are induced with 0.5% L-arabinose for 2-3 hours. T7/NT plasmids are transformed into the expression strain BLR(DE3) pLysS before screening. T7/NT cultures are induced by the addition of 1 mM IPTG and incubated for 2 hours. Whole cell lysates of induced cultures are run on SDS-PAGE in duplicate. One gel is stained with Coomassie and the other transferred to nitrocellulose and probed with antibody to the relevant epitope tag.

Positive clones are grown in 1-2 L volumes and induced for large-scale purification. Solubility and expression level of the recombinant proteins are assessed by freeze-thaw lysis of the cells, followed by DNase/RNase digestion and centrifugation at 9,000 x g for 15 minutes in a RC5B refrigerated centrifuge. The soluble fraction is removed from the insoluble material and both are then separated and evaluated for

protein localization and expression by SDS-PAGE. Soluble fusion proteins are purified by passing the soluble fraction of lysed cells over Ni-NTA (Qiagen) resin and eluting the bound proteins with imidazole. Eluted proteins are buffer exchanged on PD-10 columns (Amersham Pharmacia Biotech, Piscataway, NJ).

5 Insoluble recombinant proteins are washed using centrifugation 3 times in PBS, 0.1% Triton-X100. The inclusion bodies are then solubilized in PBS- 4 M urea and buffer exchanged through a PD-10 column (Amersham Pharmacia) into PBS, 0.01% Triton-X100, 0.5 M NaCl. Proteins are quantitated by the Lowry assay (Lowry *et al.*, 1951), and checked for purity and concentration by SDS-PAGE.

10

### EXAMPLE 10

#### GENERATION OF POLYCLONAL ANTISERA AND MONOCLONAL ANTIBODIES

To generate monoclonal antibodies, female, eight week old Blab/c mice are  
15 inoculated intraperitoneally with the gene products three times in a four week period (week 0, 2, 4). The dosage of the protein gene product is between 5 and 50  $\mu$ g. Two different fusion procedures are performed. The first fusion is done after a three-month rest period and an intraperitoneal boost with the protein; the second fusion is done after a four-month rest period and a boost by the same route. During the immunization and  
20 rest period, mouse sera recollected and tested for antibody activity by ELISA using the protein as the coating antigen.

For both fusions, the spleens are excised from two immunized mice about 72 hours after the last injection and mixed with the nonsecreting X63Ag8.653 mouse (Balb/c) myeloma cells in a 5:1 ratio (splenocytes:myeloma). The cells are allowed to  
25 fuse for four minutes in 50% (wt/wt) polyethylene glycol 1500 and 10% dimethyl sulfoxide in Dulbecco's Modified Eagle medium (D-MEM). Multiple dilutions of the fused cells are then made into the selection medium, i.e., D-MEM supplemented with hypoxanthine, aminopterin, thymine, 10% fetal bovine serum, and 10% NCTC-109 medium supplement (Gibco-BRL). The reactivity in each dilution is evaluated by SDS-PAGE western blots,  
30 dot blots, and ELISA using the gene product protein and whole bacterial cells as the detection antigens. The positive reacting hybridomas are identified and saved. These hybridomas are then further subcloned by the limiting dilution procedure to isolate the individual antibody secreting cells. The selected hybridoma cells are then used to

prepare the monoclonal antibodies. This is either performed by growing them in D-MEM and concentrating the supernatant by ammonium sulfate precipitation, or by injecting mice with the hybridoma cells and collecting the resulting ascites fluid.

5

### Example 11

#### **ELISA TITRATION OF MOUSE AND HUMAN SERA, MONOCLONAL ANTIBODIES, AND MUCOSAL WASHINGS AGAINST GENE PRODUCTS AND WHOLE BACTERIA**

10 The levels of antibodies elicited by the gene products cloned and expressed as per Example 10 toward themselves and whole bacterial cells are measured by Enzyme linked immunosorbent assay (ELISA). For the whole cell ELISA, the bacteria are grown overnight on agar medium and swabbed into PBS. The turbidity of the cells is adjusted to 0.10 at 600 nm and 100  $\mu$ l added to the wells of a 96 ELISA plate. The cells are dried overnight at 37°C, sealed with a mylar plate sealer and stored at 4°C until needed. On 15 the day of the assay, the residual protein binding sites are blocked by adding 5% non-fat dry milk in PBS with 0.1% Tween 20 (BLOTTO) and incubating at 37°C for one hour. The blocking solution is then removed and 100  $\mu$ l of sera serially diluted in the wells with BLOTTO. The sera are allowed to incubate for 1 h at 37°C. The plate wells are soaked with 300 ml PBS containing 0.1% Tween 20 for 30 seconds and washed 3 times for 5 20 seconds with a SkanWasher 300 plate washer (Skatron Instruments AS, Norway) and then incubated 1 hr at 37°C with goat anti-mouse IgG conjugated to alkaline phosphatase (BioSource International) diluted 1:1000 in BLOTTO. After washing, the plates are developed at room temperature with 100  $\mu$ l per well of 1 mg/ml p-nitrophenyl phosphate dissolved in diethanolamine buffer. Development is stopped by adding 50  $\mu$ l 25 of 3N NaOH to each well. The absorbance of each well is read at 405 nm and titers calculated by linear regression. The titer is reported as the inverse of the dilution extrapolated to an absorption value of 0.10 units.

For the antigen specific ELISA's, the proteins are diluted to a concentration of 5  $\mu$ g/ml in a 50 mM sodium carbonate buffer (pH 9.8) containing 0.02% sodium azide 30 (Sigma Chemical Co.). One hundred micro liters is added to each well of a 96 well E.I.A./R.I.A medium binding ELISA plate (Costar Corp., Cambridge, Ma.) and incubated for 16 hours at 4° C. The plates are washed and subsequently treated the same as described for whole cell ELISA procedure except, in addition to dilutions of sera, mucosal washings and monoclonal antibody suspensions are tested as well.

## EXAMPLE 12

**IMMUNOGOLD LABELING OF *ALLOIOCOCCUS OTITIDIS* AND low voltage Scanning Electron Microscopy**

5

Surface exposure of proteins on *Alloiococcus otitidis* is assessed by immunogold labeling of whole bacteria and electron microscopy. Bacteria cells are labeled as previously described (Olmsted *et al.*, 1993). Briefly, late-log phase bacterial cultures are washed twice, and resuspended to a concentration of  $1 \times 10^8$  cells/ml in 10 mM

10 phosphate buffered saline (PBS) (pH 7.4) and placed on poly-L-lysine coated glass coverslips. Excess bacteria are gently washed from the coverslips and unlabeled samples are placed into fixative (2.0% glutaraldehyde, in a 0.1 M sodium cacodylate buffer containing 7.5% sucrose) for 30 min. Bacteria to be labeled with colloidal gold are washed with PBS containing 0.5% bovine serum albumin, and the pre-immune or hyper-

15 immune mouse polyclonal antibody prepared above applied for 1 hour at room temperature. Bacteria are then gently washed, and a 1:6 dilution of goat anti-mouse conjugated to 18 nm colloidal gold particles (Jackson ImmunoResearch Laboratories, Inc., West Grove, PA) applied for 10 min at room temperature. Finally, all samples are washed gently with PBS, and placed into the fixative described above. The fixative is

20 washed from samples twice for 10 min in 0.1 M sodium cacodylate buffer, and postfixed for 30 min in 0.1 M sodium cacodylate containing 1% osmium tetroxide. The samples are then washed twice with 0.1 M sodium cacodylate, dehydrated with successive concentrations of ethanol, critical point dried by the CO<sub>2</sub> method of Anderson (Anderson, 1951) using a Samdri-780A (Tousimis, Rockville, MD), and coated with a 1-2 nm

25 discontinuous layer of platinum. *Alloiococcus otitidis* cells are then viewed with a LEO 1550 field emission scanning electron microscope operated at low accelerating voltages (1-4.5 keV) using a secondary electron detector for conventional topographical imaging and a high-resolution Robinson backscatter detector to enhance the visualization of colloidal gold by atomic number contrast.

**EXAMPLE 13****INTRANASAL AND PARENTERAL IMMUNIZATION OF MICE**

5 Six-week old, pathogen-free mice are purchased from Jackson Laboratories (Bar Harbor, Maine) and housed in cages under standard temperature, humidity, and lighting conditions. The mice, at 10 animals per group, are immunized with an appropriate amount of the protein(s) to be tested. For parenteral immunization, the protein is mixed with 100 µg of monophosphoryl lipid A (MPL™) (Corixa, Hamilton, MT) per dose to a  
10 final volume of 200 µl in saline and then injected subcutaneously (SC) into mice. All groups receive a booster with the same dose and by the same route 3 and 5 weeks after the primary immunization. Control mice are injected with MPL™ alone. All mice are bled two weeks after the last boosting; sera is then isolated and stored at -20°C. For intranasal (IN) immunization, mice receive three IN immunizations one week apart. On  
15 each occasion, an appropriate dose of the protein to be tested is formulated with 0.1 µg of CT-E29H, a genetically modified cholera toxin that is reduced in enzymatic activity and toxicity (Tebbey *et al.*, 2000), and slowly instilled into the nostril of each mouse in a 10 µl volume. Mice immunized with CT-E29H alone are used as controls. Serum samples are collected one week after the last immunization.

20

**EXAMPLE 14****IN VITRO OPSONPHAGOCYTOSIS ANALYSIS**

An *in vitro* opsonic reaction, that may mimic the *in vivo* reaction, is achieved when  
25 a mixture of *Alloicoccus otitidis* cells, heat inactivated human serum containing specific antibodies to the alloiococcal strain, and an exogenous complement source are incubated together. Opsonophagocytosis proceeds during incubation of freshly isolated human polymorphonuclear cells (PMN's) and the antibody/complement /alloiococcal cell mixture. Bacterial cells that are coated with antibody and complement are killed upon  
30 opsonophagocytosis. Colony forming units (cfu) of surviving bacteria that escape from opsonophagocytosis are determined by plating the assay mixture. Titers are reported as the reciprocal of the highest dilution that gives  $\geq 50\%$  bacterial killing, as determined by comparison to assay controls. Specimens, which demonstrate less than 50% killing at the lowest serum dilution tested (1:8) are reported as having an OPA titer of 4. The

highest dilution tested is 1:2560. Samples with  $\geq 50\%$  killing at the highest dilution are repeated, beginning with a higher initial dilution.

The method described herein is a modification of Gray's method (Gray, B.M. 1990). The assay mixture is assembled in a 96-well microtiter tissue culture plate at room temperature. The assay mixture consists of 10  $\mu\text{L}$  of test serum (a series of two-fold dilutions) heated to  $56^\circ\text{C}$  for 30 minutes prior to testing, 10  $\mu\text{L}$  of precolostral bovine serum (complement source) having no opsonic activity for the bacterial test strain, and 20  $\mu\text{L}$  of buffer containing viable *Alloiococcus otitidis* organisms. This mixture is incubated at  $37^\circ\text{C}$  without  $\text{CO}_2$  for 30 minutes with shaking. Next, 40  $\mu\text{L}$  of human PMNs, freshly prepared from heparinized peripheral blood by dextran sedimentation and Percoll density centrifugation, suspended in buffer at a concentration of  $1 \times 10^6/\text{mL}$  is added. The assay plate(s) is then incubated at  $37^\circ\text{C}$  for an additional 90 minutes with vigorous shaking. Aliquots from each well are dispensed onto the upper 1/4 of a 15 x 100 mm blood agar plate. The blood agar plate is tilted while pipetting to allow the liquid suspension to "run" down the plate. Plates are incubated overnight in  $5\% \text{CO}_2$  at  $37^\circ\text{C}$ . The viable cfu are counted the following morning. Negative control wells, lacking bacterial cells, test serum, complement and/or phagocytes in appropriate combination are included in each assay. A test serum control, which contains test serum plus bacterial cells and heat-inactivated complement, is included for each individual serum. This control is used to assess whether the presence of antibiotics or other serum components are capable of killing the bacterial strain directly (*i.e.* in the absence of complement or PMN's). A human serum with known opsonic titer is used as a positive human serum control. The opsonic antibody titer for each unknown serum is calculated as the reciprocal of the initial dilution of serum giving 50% cfu reduction compared to the control without serum.

#### EXAMPLE 15

##### MOUSE NASAL CLEARANCE MODEL

The gene products are evaluated in a mouse nasal clearance model. Groups of at least ten mice, of either the C3H/HeJ or Balb/C strains, are immunized as described above. Approximately two weeks after the last immunization, the mice are anesthetized with 1.2 mg of ketamine HCl (Ft. Dodge Laboratories, Ft. Dodge, Iowa) by i.p. injection.

The mice are then challenged intranasally by placing 10  $\mu$ L of a suspension the 1104-92 isolate of *Alloiococcus otitidis* prepared to an  $A_{550}$  of 0.5 in the nose and allowing the animal to inhale it. The 1104-92 isolate used for this challenge is passaged twice in mice by intranasal instillation to select for a variant with optimal colonization capacity. After  
5 five hours the mice are killed, their nasal turbinates removed, homogenized in 2 ml of sterile saline, appropriately diluted, and plated onto selective agar medium. The selective medium is a Columbia based agar supplemented with 0.5% Tween-80, 0.5% azide and 20 mg/L erythromycin. Owing to its slow growth, *Alloiococcus otitidis* requires 3 to 4 days before colonies a visible on this medium. The degree of clearance of the  
10 immunized mice is calculated as the percent decrease in colony forming units (CFUs) and statistically compared to a set of mice immunized with an unrelated protein such as CRM, Keyhole Limpet Hemocyanin (KLH) or other protein not derived from *Alloiococcus otitidis*.



**L. REFERENCES**

- U.S. Patent 4, 196,265  
U.S. Patent 4, 522,811  
5 U.S. Patent 4,554,101  
U.S. Patent 4,683,195  
U.S. Patent 4,683,202  
U.S. Patent 4,736,866  
U.S. Patent 4,816,567  
10 U.S. Patent 4,837,151  
U.S. Patent 4,870,009  
U.S. Patent 4,873,191  
U.S. Patent 4,873,316  
U.S. Patent 4,987,071  
15 U.S. Patent 5,116,742  
U.S. Patent 5,168,062  
U.S. Patent 5,223,409  
U.S. Patent 5,328,470  
U.S. Patent 5,580,859  
20 U.S. Patent 5,643,576  
U.S. Patent 6,127,170  
U.S. Patent 6,113,918  
U.S. Patent 6,168,918  
U.S. Patent 6,168,943  
25 U.S. Patent 6,207,646  
International Application No. EP 125,023  
International Application No. EP 171,496  
International Application No. EP 184,187  
International Application No. EP 264,166  
30 International Application No. EP 524,800  
International Application No. EP PCT/US86/02269  
International Application No. WO 00/18434  
International Application NO. WO 00/36776

- International Application No. WO 86/01533  
International Application No. WO 90/02809  
International Application No. WO 91/17271  
International Application No. WO 92/01047  
5 International Application No. WO 92/09690  
International Application No. WO 92/15679  
International Application No. WO 92/18619  
International Application No. WO 92/19265  
International Application No. WO 92/20791  
10 International Application No. WO 93/01288  
International Application No. WO 93/13302  
International Application No. WO 97/07668  
International Application No. WO 97/07669  
International Application No. WO 00/63364  
15 *Abravaya et al., Nucleic Acids Res.*, 23:675-682, 1995  
*Adams et al., Nature* 355:632-634, 1992  
*Adams et al., Nature* 377 Supp:3-174, 1995  
*Adams et al., Science* 252:1651-1656, 1991  
*Aguiree, M., and M.D. Collins*, 1992 Phylogenetic analysis of *Alloiococcus otitis* I gen. Nov.,  
20 sp. Nov., and organism from human ear fluid: *Internat. J. System Bacteriol.*, v. 42, p. 79-83.  
*Altschul, et al*, "Gapped BLAST and PSI – BLAST" a generation of protein database search  
programs" *Nuc. Acids Res.* 25(17):33890-402, 1997  
*Altschul et al, J. Molec. Biol.* 215:403-410, 1990  
*Amann et al., Gene* 69:301-315, 1988.  
25 *Anderson*, "Techniques for the preservation of three-dimensional structure in preparing  
specimens for the electron microscope." *Trans. N.Y. Acad. Sci.* 13(130): 130-134, 1951  
*Arlinghaus et al.*, Analysis of biosensor chips for identification of nucleic acids, *Analytical*  
*Chemistry* 69(18):3747-53, 1997.  
*Bairoch and Apweiler, Nucleic Acids Research*, 28:45-48, 2000.  
30 *Baldari et al*, A novel leader peptide which allows efficient secretion of a fragment of  
human interleukin 1 beta in *Saccharomyces cerevisiae*, *EMBO Journal.*, 6(1):229-34,  
1987.  
*Banerji et al., Cell*,33:729-740; 1983

- Barker *et al.*, *Nucleic Acids Research*, 29:29-32, 2001.
- Bartel and Szostak, *Science* 261:1411-1418, 1993.
- Bartel *et al.*, *Biotechniques* 14:920-924, 1993(b).
- Bartel, "Cellular Interactions and Development: A Practical Approach" I, pp. 153-179,  
5 1993(a).
- Bateman *et al.*, The Pfam protein families database," *Nucleic Acid Res.*, 28(1), 263-266,  
2000.
- Benson, "Tandem repeats finder: a program to analyze DNA sequences," *Nucleic Acids  
Res.* 27(2):573-80, 1999.
- 10 Beswick, A. J., B. Lawley, and A.P. Fraise, 1999, Detection of *Alloicoccus otitis* in  
mixed bacterial populations from middle-ear effusions of patients with otitis media:  
*Lancet* v. 354, p. 386-389.
- Boliver *et al.*, Construction and characterization of new cloning vehicles. II. A  
multipurpose cloning system, *Gene*, 2(2):95-113, 1977.
- 15 Borodovsky and McInich 1993, *Comp. Chem.* 17:123.
- Bradley, *Current Opinion in Biotechnology* 2:823-829, 1991
- Bradley, in "Teratocarcinomas and Embryonic Stem Cells: A Practical Approach," E.J.  
Robertson, ed., IRL, Oxford, pp. 113-152, 1987.
- Briles *et al.*, "Intranasal immunization of mice with a mixture of the pneumococcal  
20 proteins PsaA and PspA is highly protective against nasopharyngeal carriage of  
*Streptococcus pneumoniae*," *Infect. Immun.* 68(2):796-800, 2000.
- Bunzow *et al.*, *Nature*, 336:783-787, 1988.
- Burge and Karlin, "Prediction of complete gene structures in human genomic DNA." *J.  
Mol. Biol.* 268:78-94, 1997.
- 25 Butler *et al.*, "Pneumococcal vaccines: history, current status, and future directions," *Am.  
J. Med.* 107(1A):69S, 76S, 1999.
- Byrne and Ruddle, *PNAS* 86:5473-5477, 1989.
- Calame and Eaton, *Adv. Immunol.* 43:235-275, 1988.
- Campes and Tilghman, *Genes Dev.* 3:537-546, 1989.
- 30 Chang, *et al.*, Phenotypic expression in *E. coli* of a DNA sequence coding for mouse  
dihydrofolate reductase, *Nature* 275(5681), October 19, 1978.
- Chen *et al.*, *PNAS* 91:3054-3057, 1994.
- Cohen *et al.*, *Adv. Chromatogr.* 36:127-162, 1996.

- Cotton *et al.*, *PNAS* 85:4397, 1988.
- Cotton, *Mutat. Res.* 285-125-144, 1993.
- Cowan *et al.*, "RGS Proteins: Lessons from the RGS9 subfamily," *Progress in Nucleic Acid Research and Molecular Biology* 65:341-359, 2001.
- 5 Crain *et al.*, "Streptococcus pneumoniae surface protein A (PspA) is serologically highly variable and is expressed by all clinically important capsular serotypes of Streptococcus pneumoniae.: *Infect. Immun.* 58(10):3293-9, 1990.
- Cserzo *et al.*, "Prediction of Transmembrane alpha-helices in prokaryotic membrane proteins: the dense alignment surface method," *Protein Engineering* 10(6):673-6, 1997.
- 10 DeRisi *et al.*, Use of cDNA microarray to analyze gene expression patterns in human cancer, *Nature Genetics* Dec14(4):457-460, 1996.
- D'Eustachio *et al.*, *Science* 220: 919-924, 1983.
- Devereux *et al.*, "Competence and virulence of streptococcus pneumoniae: Adc and PsaA mutants exhibit a requirement for Zn and Mn resulting from inactivation of putative
- 15 ABC metal permeases," *Mol. Microbiol.* 25(4):727-739, 1997.
- Dintilhac, *et al.*, "Competence and virulence of Streptococcus pneumoniae: Adc and PsaA mutant exhibit a requirement for Zn and Mn resulting from inactivation of putative ABC metal permeases," *Mol. Microbiol.* 25(4):727-739, 1997.
- Doestschman *et al.*, "Antibody response to pneumococcal vaccination in children
- 20 younger than five years of age," *J. Infect. Dis.* 148:131-137, 1983.
- Douglas *et al.*, "Antibody response to pneumococcal vaccination in children younger than five years of age," *J. Infect. Dis.* 148:131-137, 1983.
- Eddy, "Hidden Markov Models: *Current Opinion in Structural Biology* 6(3):361-5, 1996.
- Edlund *et al.*, *Science* 230:912-916, 1985.
- 25 Eichelbaum, *Clin. Exp. Pharmacol Physiol*, 23(10-11):983-985, 1996.
- Elledge *et al.*, *Proc. Natl. Acad. Sci. USA*, 88:1731-1735, 1991.
- Eng, McCormack and Yates, "An approach to correlate tandem mass-spectral data of peptides with amino-acid sequences in a protein database," *Journal of the American Society for Mass Spectrometry*, 5:976-989, 1994.
- 30 Ewing *et al.*, 1988., *Genome Res.* 8: 175-185.
- Ewing and Green, 1988, *Genome Res.* 8:685-734. Reads were assembled using PHRAP (P. Green, Abstracts of DOE Human Genome Program Contractor-Grantee Workshop V, Jan. 1996, p 157.)

- Faden, H., and D. Dryja, 1989, Recovery of a unique bacterial organism in human middle ear fluid and its possible role in chronic otitis media: *J. Clin. Microbiol.*, v. 27, p. 2488-2491.
- Fan, Y. *et al.*, *PNAS*, 87:6223-27, 1990
- 5 Finely *et al.*, *Proc. Natl. Acad. Sci. USA*, 91:12980-12984, 1994.
- Foster and Hook, "Surface protein adhesins of *Staphylococcus aureus*,": *Trends Microbiol.* 6(12):484-8, 1998.
- Fraser *et al.*, Genomic sequence of a Lyme disease spirochaete, *Borrelia burgdorferi*" *Nature* 390(6660):580-6, 1997.
- 10 Frohman *et al.*, *Proc. Natl. Acad. Sci. USA* 85, 8998-9002, 1988.
- Gabizon, *et al.*, Effect of liposome composition and other factors on the targeting of liposomes to experimental tumors: biodistribution and imaging studies, *Cancer Research* 50(19):6371-6378, October 1, 1990.
- Gaultier *et al.*, *Nucleic Acids Res.* 15:6625-6641, 1987.
- 15 Gentz *et al.*, *Proc. Natl. Acad. Sci. USA*, 86:821-824, 1989.
- Goldstein and Garau, "30 years of penicillin-resistant *S. pneumoniae*: myth or reality?," *Lancet* 350(9073):233-4.
- Gray, *Conjugate Vaccines Supplement* p694-697, 1990.
- Griffen *et al.*, *Appl. Biochem Biotechnol.* 38:147-159, 1993.
- 20 Gunnar von Heijne, "Membrane Protein Structure Prediction, Hydrophobicity Analysis and the Positive-inside Rule" *J. Mol. Biol.*, 225:487-494, 1992.
- Harlow and Lane, "Antibodies: A Laboratory Manual," Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1988.
- Harper *et al.*, *Cell*, 75:805-816, 1993.
- 25 Haselhoff and Gerlach, *Nature* 334:585-591, 1988.
- Haselhoff and Gerlach, 1988 (p. 634).
- Hausdorff *et al.*, "Which pneumococcal serogroups cause the most invasive disease: implications for conjugate vaccine formulation and use, part I," *Clinical Infectious Diseases* 30(1):100-21, 1997.
- 30 Hayashi, *Genet. Anal. Tech. Appl.* 9:73-79, 1992.
- Helene *et al.*, *Ann N.Y. Acad. Sci.* 660:27-36, 1992.
- Helene *et al.*, *Anticancer Drug Des.* 6(6):569-84, 1991.

- Hendolin, P.H., U Karkkainen, T. Himi, A. Markkanen, and J. Ylikoski, 1999, High incidence of *Alloioicoccus otitis* in otitis media with effusion: *Pediatr Infect. Disc. J.*, v. 18, p. 860-865.
- Hendolin, P.H., A. Markkanen, J. Ylikoski, and J.J. Wahlfors, 1997, Use of multiplex PCR  
5 for simultaneous detection of four bacterial species in middle ear effusions: *J. Clin. Microbiol.*, v. 35, p. 2845-2858.
- Hendolin, P.H., L. Paulin, and J. Ylikoski, 2000, Clinically applicable multiplex PCR for middle ear pathogens: *J. Clin. Microbiol.*, v. 38 p. 125-132.
- Hernandez-Sanchez *et al.*, "Lambda bar minigene-mediated inhibition of protein  
10 synthesis involves accumulation of peptidyl-tRNA and starvation for tRNA," *EMBO Jour.* 17(13), 3758-65, 1998.
- Hitzeman *et al.*, Isolation and characterization of the yeast 3-phosphoglycerokinase gene (PGK) by an immunological screening technique, *Journal of Biol. Chem.*, 255(24): 12073-80, 1980
- 15 Hogan, "Manipulating the Mouse Embryo", *Cold Spring Harbor Laboratory Press*, Cold Spring Harbor, N.Y., 1986.
- Howell, E. and D. Lane "Antibodies" A Laboratory Manual, *Cold Spring Harbor Laboratory*, 1988.
- Inoue *et al.*, *FEBS Lett.* 215:327-330, 1987(a).
- 20 Inoue *et al.*, *Nucleic Acids Res.* 15:6131-6148, 1987(b)
- Isberg, R. R., and G. Tran Van Nhieu, 1994, Binding and internalization of microorganisms by integrin receptors: *Trends in Microbiology*, v. 2, p. 10-4, 1994.
- Iwabuchi *et al.*, *Oncogene* 8:1693-1696, 1993.
- Johnson *et al.*, 1993 (p. 640)
- 25 Jones, 1977
- Kaufman *et al.*, *EMBO J* 6:187-195, 1987.
- Kessel and Gruss, *Science*, 249:374-379, 1990.
- Kingsman *et al.*, Replication in *Saccharomyces cerevisiae* of plasmid pBR313 carrying DNA from the yeast *trp1* region. *Gene*. Oct;7(2):141-52, 1979.
- 30 Klein, J.O., Otitis media: *Clin. Infect. Dis.*, v. 19, p 823-833 (1994).
- Koebnik, "Proposal for a peptidoglycan-associating alpha-helical motif in the C-terminal regions of some bacterial cell-surface proteins," *Mol. Microbiol.* 16(6):1269-70, 1995.,
- Kurjian and Herskowitz, *Cell* 933-943, 1982.

- Kyte and Doolittle, A simple method for displaying the hydropathic character of a protein, *J. Mol. Biol.*, 157:105-132, 1982.
- Laemmli, "Cleavage of structural proteins during the assembly of the head of bacteriophage T4," *Nature* (London) 227:680-685, 1970.
- 5 Lakso *et al.*, *PNAS* 89:6232-6236, 1992
- Lenette, "General principles for laboratory diagnosis of viral, rickettsial, and chlamydial infections,": p. 17-18, diagnostic procedures for viral, rickettsial, and chlamydial infections, vol. 7<sup>th</sup> edition, 1995.
- Lewis, "Programmed death in bacteria," *Microbiol. Mol. Biol. Rev.* 64(3):503-14, 2000.
- 10 Li *et al.*, *Cell* 69:915, 1992.
- Linder, *Clin. Chem.* 43(2):254-266, 1997.
- Lipshutz *et al.*, Using oligonucleotide probe arrays to access genetic diversity, *Biotechniques*, 19(3):442-447, 1995.
- Livache *et al.*, Preparation of a DNA matrix via an electrochemically directed
- 15 copolymerization of pyrrole and oligonucleotides bearing a pyrrole group, *Nucleic Acids Research*. 11;22(15):2915-21, 1994
- Lockhart *et al.*, Expression monitoring by hybridization to high-density oligonucleotide arrays, *Nat. Biotechnol.* 14(13):1649,1996.
- Loessner *et al.*, "Evidence for a holin-like protein gene protein gene fully embedded out
- 20 of frame in the endolysin gene of Staphylococcus aureus bacteriophage 187,": *J. Bacteriol.* 181(15):4452-60, 1999.
- Lowery *et al.*, "Protein measurement with the Folin-Phenol reagents,": *J. Biol. Chem.* 193:265-275, 1951.
- Luckow and Summers, *Virology* 170:31-39, 1989.
- 25 Luckashin and Borodovsky, "GeneMark<sup>TM</sup>.hmm: new solutions for gene finding,": *Nuc. Acids Res.* 26(4):1107-15, 1998.
- Maher, Inhibition of T7 RNA polymerase initiation by triple-helical DNA complexes: a model for artificial gene repression, *Biochemistry*, 31(33):7587-94, 1992.
- Maher, *Bioassays* 14(12):807-15, 1992.
- 30 Mansour *et al.*, *Nature* 336:348, 1988.
- Maxim and Gilbert, *PNAS*, 74:560, 1997.
- Mazimanian *et al.*, :Staphylococcus aureus sortase, an enzyme that anchors surface proteins to the cell wall,": *Science* 285(5428):760-3, 1999.

- McAtee *et al.*, "Characterization of a *Helicobacter pylori* vaccine candidate by proteome techniques,": *J. Chromatogr. B. Biomed. Sci. Appl.* 714(2)325-33, 1998(c).
- McAtee, C.P., K. E. Fry, and D.E. Berg, 1998a Identification of potential diagnostic and vaccine candidates of *Helicobacter pylori* by "proteome" technologies: *Helicobacter*, v. 3, 5 p. 163-9/
- McAtee C.P., M.Y. Lim, K. Fung, M. Velligan, K. Fry, T. Chow, and D.E. Berg, 1998b, Identification of potential diagnostic and vaccine candidates of *Helicobacter pylori* by two-dimensional gel electrophoresis, sequence analysis, and serum profiling: *Clin. Diagn. Lab Immunol*, v.5, p. 537-42
- 10 McDaniel *et al.*, "Monoclonal antibodies against protease-sensitive pneumococcal antigens can protect mice from fatal infection with *Streptococcus pneumoniae*,": *J. Exp. Med.* 160(2):386-97, 1984.
- Mejlhede *et al.*, "Ribosomal-1 frame shifting during decoding of *Bacillus subtilis* odd occurs at the sequence CGA AAG," *J. Bacteriol.* 181(9):2930-7, 1999.
- 15 Merel, p. 1994
- Morrison *et al.*, "Isolation and characterization of three new classes of transformation deficient mutants of *Streptococcus pneumoniae* that are defective in DNA transport and genetic recombination,": *Journal of Bacteriology*, 156:281-290, 1983.
- Morin *et al.*, *Nucleic Acids Res.*, 21:2157-2163, 1993.
- 20 Myers *et al.*, *Nature* 313:495, 1985(a).
- Myers *et al.*, *Science* 230:1242, 1985(b).
- Nabors *et al.*, "Immunization of health adults with a single recombinant pneumococcal surface protein A (PspA) variant stimulates broadly cross-reactive antibodies to heterologous PspA molecules," *Vaccine* 18:1743-1754m 2000.
- 25 Nakai and Kanehisa, "Expert system for predicting protein localization sites in gram-negative bacteria,": *Proteins* 11(2) 95-110, 1991.
- Navarre and Schneewind, "Surface Proteins of Gram-Positive Bacteria and Mechanisms of Their Targeting to the Cell Wall Envelope,": *Microbiol. Mol. Biol. Rev.* 63(1):174-229, 1999.
- 30 Nielsen *et al.*, *Science* 251:1351-1355, 1997`.
- O'Gon-nan *et al.*, *Science* 251:1351-1355, 1991.



- Olmsted *et al.*, "High-resolution visualization by field emission scanning electron microscopy of *Enterococcus faecalis* surface proteins encoded by the pheromone-inducible conjugative plasmid pCF10." *J. Bacteriol.* 175(19):6229-37, 1993.
- Orita *et al.*, "Peritoneal culture alters *Streptococcus pneumoniae* protein profiles and virulence properties," *Infect. Immun.* 68:6082-6086, 2000.
- Orihuela *et al.*, "Peritoneal culture alters *Streptococcus pneumoniae* protein profiles and virulence properties," *Infect. Immun.* 68:6082-6086, 2000.
- Park and Teichmann, "DIVCLUS: an automatic method in the GEANFAMMER package that finds homologous domains in single- and multi-domain proteins," *Bioinformatics* 14(2):144-50, 1998.
- Parkhill *et al.*, "Complete DNA sequence of a serogroup A strain of *Neisseria meningitidis* Z2491," *Nature* 404(6777):502-6, 2000.
- Pierschbacher and Ruoslahti, "Influence of stereochemistry of the sequence Arg-Gly-Asp-Xaa on binding specificity in cell adhesion," *J. Biol. Chem.* 262(36):17294-8, 1987.
- Pinkert, "An albumin enhancer located 10 kb upstream functions along with its promoter to direct efficient, liver-specific expression in transgenic mice," *Genes & Development* (3): 268-76, 1987.
- Pizza *et al.*, "Identification of vaccine candidates against serogroup B meningococcus by whole-genome sequencing," *Science* 287(5459):1816-20, 2000.
- Pugsley, "The complete general secretory pathway in gram-negative bacteria," *Microbiol. Rev.* 57(1):50-108, 1993.
- Queen and Baltimore, "Immunoglobulin gene transcription is activated by downstream sequence elements," *Cell*, 33:741-748, 1983.
- Raham *et al.*, *Journal of Neuroscience* 19:2016-2026, 1999.
- Ranade, V.V., "Drug delivery systems. 1. site-specific drug delivery using liposomes as carriers," *Journal of Clinical Pharmacology*, 29(8):685-94, 1989.
- Rose *et al.*, "Methods in Yeast Genetics: A Laboratory Course Manual," *Cold Harbor Press*, Cold Spring Harbor, N.Y. (1990).
- Rosenow *et al.*, "Contribution of novel choline-binding proteins to adherence, colonization and immunogenicity of *Streptococcus pneumoniae*," *Mol. Microbiol.* 25(5):819-29, 1997.

- Ross and Wilkie, "GTP'ase-activating proteins for Heterotrimeric G proteins: Regulators of G protein Signaling (RGS) and RGS-like proteins,": *Annual Review of Biochemistry* 69:795-827, 2000.
- Saleeba *et al.*, *Meth. Enzymol.* 217:286-295, 1992.
- 5     Salzberg *et al.*, "Microbial gene identification using interpolated Markov models,": *Nuc. Acids. Res.* 26(2):544-8, 1998.
- Sambrook *et al.*, "Molecular Cloning: A Laboratory Manual: 2<sup>nd</sup>, ed., Cold Spring Harbor Laboratory, *Cold Spring Harbor Laboratory Press*, Cold Spring Harbor, N.Y. 1989.
- Sampson *et al.*, "Cloning and nucleotide sequence analysis of psaA, the *Streptococcus pneumoniae* gene encoding a 37-kilodalton protein homologous to previously reported
- 10     *Streptococcus* Sp. Adhesins,": *Infect Immun.* 62(1):319-24, 1994.
- Sanger, PNAS 74:5463, 1977.
- Schappert, S., 1991, Office Visits for Otitis Media: United States, 1975-1990: DHHS publication No. PHS 92-1250; Hyattsville, MD, US Dept. of Health and Human Sciences,
- 15     Public Health Services, Centers for Disease Control and Prevention, National Center
- Schultz *et al.*, *Gene* 54:113-123, 1987
- Schultz, 1987 (p.646).
- Seed, B., "An LFA-3 cDNA encodes a phospholipid-linked membrane protein homologous to its receptor CD2, *Nature*, 329(6142):840-842, 1987.
- 20     Seed B. and Aruffo A, "Molecular cloning of the CD2 antigen, the T-cell erythrocyte receptor, by a rapid immunoselection procedure, *Proc. Natl. Acad. Sciences U.S.A.* 1987
- Sebwenlist *et al.*, 1980
- E.L. Shledon, 1993
- Shinefield and Black, "Efficacy of pneumococcal conjugate vaccines in large scale field
- 25     trials (In Process Citation), "*Pediatr. Infect. Dis. J.* 19(4):394-7, 2000
- Shoemaker *et al.*, 1996
- Sih, T., B. Schwartz, G. Bosley, and R. Facklam, 1992, "Chronic otitis media with effusion caused by *Alloiooccus otitis*: clinical and laboratory features: the 32<sup>nd</sup> Interscience Conference on Antimicrobial Agents and Chemotherapy, p. 222.
- 30     Simon *et al.*, *Science*, 252:802-8, 1991.
- Smith and Johnson, *Gene* 67:31-40, 1988.
- Smith *et al.*, *Mol. Cell Biol.* 3:2156-2165, 1983.

- Smith, T.L. and Waterman, M.S. Waterman, Identification of common molecular subsequences. *J. Mol. Biol.*, 147, 195-197 (1981).
- Songyang, *et al.*, *Cell* 72:767-778, 1993.
- Sonhammer, E.L., G. von Heijne, and A Krogh, 1988, A hidden Markov model for  
5 predicting transmembrane helices in protein sequences: *Ismb*, v. 6, p. 175-82.
- Sonnhammer, E.L., S.R. Eddy, and R. Durbin, 1997 Pfam: a comprehensive database of protein domain families based on seed alignments: *Proteins*, v. 28, p. 405-20.
- Stinchcomb *et al.*, 1979
- Stratford, Perricaudet, *et al.*, 1992.
- 10 Sonnenberg and Belisle, "Definition of *Mycobacterium tuberculosis* culture filtrate proteins by two-dimensional polyacrylamide gel electrophoresis, N-terminal amino acid sequencing, and electrospray mass spectrometry," *Infect. Immun.* 65(11):4515-24, 1997.
- Sosnowsky *et al.*, 1997.
- Stockbauer *et al.*, "A natural variant of the cysteine protease virulence factor of group A  
15 streptococcus with an arginine-glycine-aspartic acid (RGD) motif preferentially binds human integrins  $\alpha$ 5 $\beta$ 3 and  $\alpha$ IIb $\beta$ 3 (In Process Citation),: *Proc. Natl. Acad. Sci. USA* 96(1):242-7, 1999.
- Studier *et al.*, "Protection of mice against fatal pneumococcal challenge by immunization with pneumococcal surface adhesin A (PsaA),: *Microb. Pathog.* 21(1):17-22, 1996
- 20 Studier *et al.*, Use of T7 RNA polymerase to direct expression of cloned genes, *Methods in Enzymology*, 185:60-89, 1990.
- Talkington *et al.*, "Protection of mice against fatal pneumococcal challenge by immunization with pneumococcal surface adhesin A (PsaA),: *Microb. Pathog.* 21(1):17-22, 1996.
- 25 Tebbey *et al.*, "Effective mucosal immunization against respiratory syncytial virus using a genetically detoxified cholera holotoxin, CT-E29H," *Vaccine* 18(24):2723-34, 2000.
- Thomas and Capecchi, *Cell* 51:503, 1987
- Welding *et al.*, "Two-dimensional electrophoresis for analysis of *Mycobacterium tuberculosis* culture filtrate and purification and characterization of six novel proteins,"  
30 *Infect. Immun.* 66(8):3492-500, 1998.
- Wilmut *et al.*, *Nature* 385:810-813, 1997.
- Wilson *et al.*, *Cell* 37:767, 1984.

Winoto and Baltimore, A novel, inducible and T cell-specific enhancer located at the 3' end of the T cell receptor alpha locus, *EMBO Journal*. 8(3):729-733, 1989.

Xu *et al.*, "PHR1 encodes an abundant, pleckstrin homology domain-containing Integral membrane protein in the photoreceptor outer segments,": *Journal of Biological Chemistry*  
5 274:35676-35685, 1999.

Yamamoto *et al.*, "A nontoxic adjuvant for mucosal immunity to pneumococcal surface protein,": *A. J. Immune*. 161(8):4115-21, 1998.

Yershov *et al.*, DNA analysis and diagnostics on oligonucleotide microchips, *Proc. Natl. Acad. Sciences U.S.A.* 93(10):4913-8, 1996.

10 Servos *et al.*, *Cell* 72:223-232, 1993.

Zhang *et al.*, 2001, "Recombinant PhpA Protein, a Unique Histidine Motif-Containing Protein from *Streptococcus pneumoniae*, Protects Mice against Intranasal Pneumococcal Challenge,": *Infect. Immun.* 69:3827-3836

15

**WHAT IS CLAIMED IS:**

1. An isolated polynucleotide of an *Alloiococcus otitidis* genomic sequence, wherein the polynucleotide comprises a nucleotide sequence having at least about 70% identity to a nucleotide sequence chosen from one of odd numbered sequences from SEQ ID NO: 1 to SEQ ID NO: 6649, a complement thereof, a degenerate variant thereof, and a fragment thereof.
2. The polynucleotide of claim 1, wherein the polynucleotide is a complement to a nucleotide sequence chosen from one of odd numbered sequences from SEQ ID NO: 1 to SEQ ID NO: 6649, a complement thereof, a degenerate variant thereof, and a fragment thereof.
3. The polynucleotide of claim 2, wherein the polynucleotide is selected from the group consisting of genomic DNA, cDNA and RNA.
4. The polynucleotide of claim 3, wherein the polynucleotide further comprises heterologous nucleotides.
5. An isolated polynucleotide which hybridizes to a nucleotide sequence chosen from one of the odd numbered sequences from SEQ ID NO: 1 to SEQ ID NO: 6649, a complement thereof, a degenerate variant thereof, or a fragment thereof, under high stringency hybridization conditions.
6. The polynucleotide of claim 5, wherein the polynucleotide hybridizes under intermediate stringency hybridization conditions.
7. An isolated polynucleotide of an *Alloiococcus otitidis* genomic sequence, wherein the polynucleotide comprises a nucleotide sequence chosen from one of odd numbered sequences from SEQ ID NO: 1 to SEQ ID NO: 6649, a complement thereof, a fragment thereof, or a degenerate variant thereof, and encodes a polypeptide, a biological equivalent thereof, or a fragment thereof, and is selected from the group consisting of:

- (a) an *Alloiococcus otitidis* polypeptide predicted by SignalP algorithm analysis as having met all four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and predicted by HMM SignalP algorithm analysis as having a signal peptide;
- 5 (b) an *Alloiococcus otitidis* polypeptide predicted by SignalP algorithm analysis as having met three of the four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and predicted by HMM SignalP algorithm analysis as having a signal peptide;
- 10 (c) an *Alloiococcus otitidis* polypeptide predicted by HMM Signal P algorithm analysis as having a signal peptide;
- (d) an *Alloiococcus otitidis* polypeptide predicted by HMM Signal P algorithm analysis as being a non-secretory protein and by PSORT program to be localized to the cytoplasmic membrane;
- (e) an *Alloiococcus otitidis* polypeptide identified by BlastP analysis;
- 15 (f) an *Alloiococcus otitidis* polypeptide identified by Pfam analysis;
- (g) an *Alloiococcus otitidis* polypeptide identified using proteomics methodology as sharing homology with surface exposed proteins of *Streptococcus pneumoniae*;
- (h) an *Alloiococcus otitidis* lipoprotein;
- 20 (i) an *Alloiococcus otitidis* polypeptide having a LPXTG motif, wherein the polypeptide is covalently attached to the peptidoglycan layer;
- (j) an *Alloiococcus otitidis* polypeptide, wherein the polypeptide is non-covalently associated with the peptidoglycan layer;
- (k) an *Alloiococcus otitidis* polypeptide having an RGDX motif wherein X is not a proline residue;
- 25 (l) an *Alloiococcus otitidis* polypeptide predicted by BlastP as being involved in capsule biosynthesis and transport;
- (m) an *Alloiococcus otitidis* polypeptide identified by BlastP as being localized within the capsule loci of the *Alloiococcus otitidis* genome;
- 30 (n) an *Alloiococcus otitidis* polypeptide predicted by BlastP as being associated with sporulation;
- (o) an *Alloiococcus otitidis* polypeptide encoded by unique ORFs identified by BlastP analysis as having a BlastP 'E Value' of  $> e^{-10}$ ;

- (p) an *Alloiococcus otitidis* polypeptide identified by Glimmer™ ORF finder program;
- (q) an *Alloiococcus otitidis* polypeptide identified by GeneMark™ ORF finder program;
- 5 (r) an *Alloiococcus otitidis* polypeptide identified by an ORF finder program that searches for an ATG, GTG or TTG Start codon between a Stop-Stop region; and
- (s) an *Alloiococcus otitidis* polypeptide identified by an ORF finder program that searches for a transmembrane domain between two Stop codons and
- 10 a Start codon immediately upstream of this transmembrane region.
8. The polynucleotide of claim 7, wherein the polynucleotide is a complement to a nucleotide sequence selected from one of the odd numbered sequences from SEQ ID NO: 1 to SEQ ID NO: 6649, a degenerate variant thereof, and a fragment
- 15 thereof.
9. The polynucleotide of claim 8, wherein the polynucleotide is selected from the group consisting of genomic DNA, cDNA and RNA.
- 20 10. The polynucleotide of claim 9, wherein the polynucleotide further comprises heterologous nucleotides.
11. The polynucleotide of claim 10, wherein the polynucleotide encodes a fusion polypeptide.
- 25 12. The polynucleotide of claim 7 wherein the polynucleotide encodes a polypeptide, which is predicted by SignalP algorithm analysis as having met all four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide, and which is predicted by HMM SignalP algorithm analysis as having a signal peptide, and the polynucleotide is selected from one of Seq. ID No. 89, Seq. ID No. 127, Seq. ID No. 131, Seq. ID No. 133, Seq. ID No. 161, Seq. ID No. 163, Seq. ID No. 213, Seq. ID No. 215, Seq. ID No. 225, Seq. ID No. 249, Seq. ID No. 251, Seq. ID No. 287, Seq. ID No. 289, Seq. ID No. 369, Seq. ID No. 371, Seq. ID No. 375, Seq.
- 30

5 ID No. 377, Seq. ID No. 497, Seq. ID No. 503, Seq. ID No. 505, Seq. ID No. 527,  
Seq. ID No. 549, Seq. ID No. 575, Seq. ID No. 617, Seq. ID No. 657, Seq. ID No.  
659, Seq. ID No. 661, Seq. ID No. 675, Seq. ID No. 715, Seq. ID No. 717, Seq.  
ID No. 745, Seq. ID No. 747, Seq. ID No. 755, Seq. ID No. 757, Seq. ID No. 759,  
Seq. ID No. 761, Seq. ID No. 773, Seq. ID No. 807, Seq. ID No. 967, Seq. ID No.  
973, Seq. ID No. 975, Seq. ID No. 1013, Seq. ID No. 1025, Seq. ID No. 1027,  
Seq. ID No. 1039, Seq. ID No. 1075, Seq. ID No. 1089, Seq. ID No. 1195, Seq.  
ID No. 1197, Seq. ID No. 1207, Seq. ID No. 1239, Seq. ID No. 1243, Seq. ID No.  
10 1245, Seq. ID No. 1269, Seq. ID No. 1315, Seq. ID No. 1317, Seq. ID No. 1331,  
Seq. ID No. 1365, Seq. ID No. 1367, Seq. ID No. 1369, Seq. ID No. 1445, Seq.  
ID No. 1447, Seq. ID No. 1513, Seq. ID No. 1517, Seq. ID No. 1545, Seq. ID No.  
1549, Seq. ID No. 1561, Seq. ID No. 1569, Seq. ID No. 1571, Seq. ID No. 1585,  
Seq. ID No. 1643, Seq. ID No. 1653, Seq. ID No. 1661, Seq. ID No. 1663, Seq.  
ID No. 1707, Seq. ID No. 1733, Seq. ID No. 1737, Seq. ID No. 1755, Seq. ID No.  
15 1765, Seq. ID No. 1767, Seq. ID No. 1775, Seq. ID No. 1791, Seq. ID No. 1805,  
Seq. ID No. 1875, Seq. ID No. 1969, Seq. ID No. 1981, Seq. ID No. 2053, Seq.  
ID No. 2055, Seq. ID No. 2087, Seq. ID No. 2089, Seq. ID No. 2091, Seq. ID No.  
2105, Seq. ID No. 2115, Seq. ID No. 2149, Seq. ID No. 2151, Seq. ID No. 2159,  
Seq. ID No. 2177, Seq. ID No. 2277, Seq. ID No. 2293, Seq. ID No. 2321, Seq.  
20 ID No. 2347, Seq. ID No. 2351, Seq. ID No. 2353, Seq. ID No. 2365, Seq. ID No.  
2395, Seq. ID No. 2421, Seq. ID No. 2425, Seq. ID No. 2427, Seq. ID No. 2429,  
Seq. ID No. 2449, Seq. ID No. 2459, Seq. ID No. 2525, Seq. ID No. 2531, Seq.  
ID No. 2607, Seq. ID No. 2651, Seq. ID No. 2679, Seq. ID No. 2693, Seq. ID No.  
2699, Seq. ID No. 2703, Seq. ID No. 2753, Seq. ID No. 2785, Seq. ID No. 2813,  
25 Seq. ID No. 2829, Seq. ID No. 2835, Seq. ID No. 2841, Seq. ID No. 2879, Seq. ID  
No. 2881, Seq. ID No. 2935, Seq. ID No. 2937, Seq. ID No. 2949, Seq. ID No.  
2965, Seq. ID No. 2967, Seq. ID No. 2973, Seq. ID No. 3007, Seq. ID No. 3009,  
Seq. ID No. 3011, Seq. ID No. 3029, Seq. ID No. 3031, Seq. ID No. 3109, Seq.  
ID No. 3111, Seq. ID No. 3219, Seq. ID No. 3223, Seq. ID No. 3273, Seq. ID No.  
30 3297, Seq. ID No. 3331, Seq. ID No. 3335, Seq. ID No. 3341, Seq. ID No. 3349,  
Seq. ID No. 3353, Seq. ID No. 3355, Seq. ID No. 3377, Seq. ID No. 3391, Seq.  
ID No. 3425, Seq. ID No. 3449, Seq. ID No. 3493, Seq. ID No. 3573, Seq. ID No.  
3611, Seq. ID No. 3619, Seq. ID No. 3689, Seq. ID No. 3753, Seq. ID No. 3755,



Seq. ID No. 3765, Seq. ID No. 3781, Seq. ID No. 3783, Seq. ID No. 3851, Seq. ID No. 3903, Seq. ID No. 4005, Seq. ID No. 4007, Seq. ID No. 4027, Seq. ID No. 4073, Seq. ID No. 4137, Seq. ID No. 4141, Seq. ID No. 4143, Seq. ID No. 4145, Seq. ID No. 4225, Seq. ID No. 4343, Seq. ID No. 4385, Seq. ID No. 4399, Seq. ID No. 4469, Seq. ID No. 4483, Seq. ID No. 4493, Seq. ID No. 4495, Seq. ID No. 4533, Seq. ID No. 4699, Seq. ID No. 4709, Seq. ID No. 4711, Seq. ID No. 4735, Seq. ID No. 4827, Seq. ID No. 4871, Seq. ID No. 4873, Seq. ID No. 4879, Seq. ID No. 4921, Seq. ID No. 4981, Seq. ID No. 5115, Seq. ID No. 5267, Seq. ID No. 5341, Seq. ID No. 5387, Seq. ID No. 5465, Seq. ID No. 5467, Seq. ID No. 5479, Seq. ID No. 5497, Seq. ID No. 5513, Seq. ID No. 5543, Seq. ID No. 5545, Seq. ID No. 5567, Seq. ID No. 5587, Seq. ID No. 5589, Seq. ID No. 5591, Seq. ID No. 5611, Seq. ID No. 5621, Seq. ID No. 5641, Seq. ID No. 5681, Seq. ID No. 5719, Seq. ID No. 5771, Seq. ID No. 5783, Seq. ID No. 5895, Seq. ID No. 5899, Seq. ID No. 5901, Seq. ID No. 5927, Seq. ID No. 5929, Seq. ID No. 5939, Seq. ID No. 5987, Seq. ID No. 6013, Seq. ID No. 6087, Seq. ID No. 6089, Seq. ID No. 6091, Seq. ID No. 6093, Seq. ID No. 6095, Seq. ID No. 6103, Seq. ID No. 6169, Seq. ID No. 6185, Seq. ID No. 6187, Seq. ID No. 6195, Seq. ID No. 6197, Seq. ID No. 6203, Seq. ID No. 6205, Seq. ID No. 6221, Seq. ID No. 6223, Seq. ID No. 6229, Seq. ID No. 6291, Seq. ID No. 6415, Seq. ID No. 6417, Seq. ID No. 6473, Seq. ID No. 6507, Seq. ID No. 6543, Seq. ID No. 6595, Seq. ID No. 6597, Seq. ID No. 6599, Seq. ID No. 6601 and Seq. ID No. 6603.

13. The polynucleotide of claim 7 wherein the polynucleotide encodes a polypeptide, which is predicted by SignalP algorithm analysis as having met three of the four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and which is predicted by HMM SignalP algorithm analysis as having a signal peptide, and the polynucleotide is selected from one of Seq. ID No. 7, Seq. ID No. 11, Seq. ID No. 23, Seq. ID No. 45, Seq. ID No. 47, Seq. ID No. 53, Seq. ID No. 59, Seq. ID No. 65, Seq. ID No. 67, Seq. ID No. 87, Seq. ID No. 91, Seq. ID No. 139, Seq. ID No. 151, Seq. ID No. 159, Seq. ID No. 165, Seq. ID No. 169, Seq. ID No. 185, Seq. ID No. 211, Seq. ID No. 217, Seq. ID No. 235, Seq. ID No. 237, Seq. ID No. 239, Seq. ID No. 271, Seq. ID No. 285, Seq. ID No. 291, Seq. ID No. 327, Seq. ID No. 349, Seq. ID No. 385, Seq. ID No. 387, Seq. ID No. 407,

Seq. ID No. 427, Seq. ID No. 431, Seq. ID No. 455, Seq. ID No. 457, Seq. ID No. 495, Seq. ID No. 499, Seq. ID No. 511, Seq. ID No. 513, Seq. ID No. 515, Seq. ID No. 525, Seq. ID No. 545, Seq. ID No. 547, Seq. ID No. 557, Seq. ID No. 569, Seq. ID No. 589, Seq. ID No. 591, Seq. ID No. 593, Seq. ID No. 595, Seq. ID No. 609, Seq. ID No. 637, Seq. ID No. 639, Seq. ID No. 641, Seq. ID No. 653, Seq. ID No. 669, Seq. ID No. 679, Seq. ID No. 719, Seq. ID No. 723, Seq. ID No. 739, Seq. ID No. 749, Seq. ID No. 751, Seq. ID No. 763, Seq. ID No. 765, Seq. ID No. 769, Seq. ID No. 777, Seq. ID No. 779, Seq. ID No. 781, Seq. ID No. 819, Seq. ID No. 895, Seq. ID No. 903, Seq. ID No. 905, Seq. ID No. 909, Seq. ID No. 935, Seq. ID No. 937, Seq. ID No. 951, Seq. ID No. 955, Seq. ID No. 979, Seq. ID No. 981, Seq. ID No. 983, Seq. ID No. 985, Seq. ID No. 1005, Seq. ID No. 1007, Seq. ID No. 1009, Seq. ID No. 1015, Seq. ID No. 1019, Seq. ID No. 1029, Seq. ID No. 1031, Seq. ID No. 1047, Seq. ID No. 1091, Seq. ID No. 1111, Seq. ID No. 1137, Seq. ID No. 1151, Seq. ID No. 1153, Seq. ID No. 1169, Seq. ID No. 1173, Seq. ID No. 1183, Seq. ID No. 1191, Seq. ID No. 1193, Seq. ID No. 1213, Seq. ID No. 1223, Seq. ID No. 1229, Seq. ID No. 1247, Seq. ID No. 1259, Seq. ID No. 1283, Seq. ID No. 1307, Seq. ID No. 1319, Seq. ID No. 1321, Seq. ID No. 1327, Seq. ID No. 1341, Seq. ID No. 1343, Seq. ID No. 1347, Seq. ID No. 1389, Seq. ID No. 1401, Seq. ID No. 1429, Seq. ID No. 1479, Seq. ID No. 1551, Seq. ID No. 1559, Seq. ID No. 1579, Seq. ID No. 1587, Seq. ID No. 1621, Seq. ID No. 1627, Seq. ID No. 1633, Seq. ID No. 1645, Seq. ID No. 1647, Seq. ID No. 1649, Seq. ID No. 1655, Seq. ID No. 1665, Seq. ID No. 1667, Seq. ID No. 1671, Seq. ID No. 1677, Seq. ID No. 1679, Seq. ID No. 1681, Seq. ID No. 1695, Seq. ID No. 1703, Seq. ID No. 1705, Seq. ID No. 1731, Seq. ID No. 1753, Seq. ID No. 1759, Seq. ID No. 1763, Seq. ID No. 1787, Seq. ID No. 1797, Seq. ID No. 1821, Seq. ID No. 1823, Seq. ID No. 1833, Seq. ID No. 1839, Seq. ID No. 1841, Seq. ID No. 1843, Seq. ID No. 1893, Seq. ID No. 1917, Seq. ID No. 1919, Seq. ID No. 1971, Seq. ID No. 1991, Seq. ID No. 2013, Seq. ID No. 2015, Seq. ID No. 2017, Seq. ID No. 2019, Seq. ID No. 2033, Seq. ID No. 2035, Seq. ID No. 2049, Seq. ID No. 2081, Seq. ID No. 2083, Seq. ID No. 2085, Seq. ID No. 2111, Seq. ID No. 2113, Seq. ID No. 2123, Seq. ID No. 2125, Seq. ID No. 2127, Seq. ID No. 2131, Seq. ID No. 2133, Seq. ID No. 2153, Seq. ID No. 2161, Seq. ID No. 2171, Seq. ID No. 2175, Seq. ID No. 2179, Seq. ID No. 2187, Seq. ID No. 2201, Seq. ID No. 2203, Seq. ID No.

2221, Seq. ID No. 2237, Seq. ID No. 2249, Seq. ID No. 2251, Seq. ID No. 2255,  
Seq. ID No. 2261, Seq. ID No. 2263, Seq. ID No. 2271, Seq. ID No. 2279, Seq.  
ID No. 2283, Seq. ID No. 2285, Seq. ID No. 2289, Seq. ID No. 2295, Seq. ID No.  
2305, Seq. ID No. 2307, Seq. ID No. 2317, Seq. ID No. 2319, Seq. ID No. 2323,  
5 Seq. ID No. 2325, Seq. ID No. 2343, Seq. ID No. 2349, Seq. ID No. 2385, Seq.  
ID No. 2393, Seq. ID No. 2423, Seq. ID No. 2453, Seq. ID No. 2491, Seq. ID No.  
2497, Seq. ID No. 2499, Seq. ID No. 2507, Seq. ID No. 2515, Seq. ID No. 2517,  
Seq. ID No. 2521, Seq. ID No. 2523, Seq. ID No. 2527, Seq. ID No. 2533, Seq.  
ID No. 2535, Seq. ID No. 2541, Seq. ID No. 2543, Seq. ID No. 2547, Seq. ID No.  
10 2549, Seq. ID No. 2557, Seq. ID No. 2573, Seq. ID No. 2583, Seq. ID No. 2601,  
Seq. ID No. 2603, Seq. ID No. 2621, Seq. ID No. 2653, Seq. ID No. 2681, Seq.  
ID No. 2691, Seq. ID No. 2701, Seq. ID No. 2733, Seq. ID No. 2739, Seq. ID No.  
2801, Seq. ID No. 2807, Seq. ID No. 2815, Seq. ID No. 2819, Seq. ID No. 2821,  
Seq. ID No. 2823, Seq. ID No. 2833, Seq. ID No. 2837, Seq. ID No. 2839, Seq.  
15 ID No. 2845, Seq. ID No. 2853, Seq. ID No. 2861, Seq. ID No. 2865, Seq. ID No.  
2873, Seq. ID No. 2875, Seq. ID No. 2877, Seq. ID No. 2883, Seq. ID No. 2895,  
Seq. ID No. 2905, Seq. ID No. 2939, Seq. ID No. 2941, Seq. ID No. 2947, Seq.  
ID No. 2981, Seq. ID No. 2983, Seq. ID No. 2987, Seq. ID No. 2991, Seq. ID No.  
2995, Seq. ID No. 3001, Seq. ID No. 3005, Seq. ID No. 3021, Seq. ID No. 3025,  
20 Seq. ID No. 3043, Seq. ID No. 3045, Seq. ID No. 3073, Seq. ID No. 3075, Seq.  
ID No. 3155, Seq. ID No. 3163, Seq. ID No. 3165, Seq. ID No. 3167, Seq. ID No.  
3183, Seq. ID No. 3213, Seq. ID No. 3215, Seq. ID No. 3235, Seq. ID No. 3245,  
Seq. ID No. 3261, Seq. ID No. 3263, Seq. ID No. 3265, Seq. ID No. 3269, Seq.  
ID No. 3271, Seq. ID No. 3275, Seq. ID No. 3277, Seq. ID No. 3317, Seq. ID No.  
25 3325, Seq. ID No. 3337, Seq. ID No. 3351, Seq. ID No. 3389, Seq. ID No. 3405,  
Seq. ID No. 3419, Seq. ID No. 3421, Seq. ID No. 3423, Seq. ID No. 3451, Seq.  
ID No. 3453, Seq. ID No. 3455, Seq. ID No. 3491, Seq. ID No. 3495, Seq. ID No.  
3503, Seq. ID No. 3505, Seq. ID No. 3517, Seq. ID No. 3519, Seq. ID No. 3545,  
Seq. ID No. 3547, Seq. ID No. 3571, Seq. ID No. 3593, Seq. ID No. 3617, Seq.  
30 ID No. 3621, Seq. ID No. 3629, Seq. ID No. 3663, Seq. ID No. 3701, Seq. ID No.  
3703, Seq. ID No. 3723, Seq. ID No. 3737, Seq. ID No. 3741, Seq. ID No. 3745,  
Seq. ID No. 3747, Seq. ID No. 3759, Seq. ID No. 3763, Seq. ID No. 3767, Seq.  
ID No. 3769, Seq. ID No. 3771, Seq. ID No. 3785, Seq. ID No. 3793, Seq. ID No.

3813, Seq. ID No. 3837, Seq. ID No. 3839, Seq. ID No. 3861, Seq. ID No. 3865,  
Seq. ID No. 3889, Seq. ID No. 3891, Seq. ID No. 3895, Seq. ID No. 3915, Seq.  
ID No. 3923, Seq. ID No. 3925, Seq. ID No. 3929, Seq. ID No. 3965, Seq. ID No.  
3975, Seq. ID No. 3979, Seq. ID No. 3995, Seq. ID No. 3997, Seq. ID No. 4009,  
5 Seq. ID No. 4039, Seq. ID No. 4041, Seq. ID No. 4061, Seq. ID No. 4079, Seq.  
ID No. 4081, Seq. ID No. 4111, Seq. ID No. 4113, Seq. ID No. 4135, Seq. ID No.  
4139, Seq. ID No. 4155, Seq. ID No. 4181, Seq. ID No. 4203, Seq. ID No. 4221,  
Seq. ID No. 4247, Seq. ID No. 4253, Seq. ID No. 4257, Seq. ID No. 4259, Seq.  
ID No. 4261, Seq. ID No. 4263, Seq. ID No. 4269, Seq. ID No. 4311, Seq. ID No.  
10 4379, Seq. ID No. 4389, Seq. ID No. 4391, Seq. ID No. 4471, Seq. ID No. 4473,  
Seq. ID No. 4481, Seq. ID No. 4525, Seq. ID No. 4551, Seq. ID No. 4561, Seq.  
ID No. 4573, Seq. ID No. 4617, Seq. ID No. 4639, Seq. ID No. 4659, Seq. ID No.  
4681, Seq. ID No. 4701, Seq. ID No. 4705, Seq. ID No. 4713, Seq. ID No. 4717,  
Seq. ID No. 4721, Seq. ID No. 4737, Seq. ID No. 4741, Seq. ID No. 4813, Seq.  
15 ID No. 4817, Seq. ID No. 4819, Seq. ID No. 4829, Seq. ID No. 4831, Seq. ID No.  
4851, Seq. ID No. 4869, Seq. ID No. 4875, Seq. ID No. 4913, Seq. ID No. 4919,  
Seq. ID No. 4929, Seq. ID No. 4931, Seq. ID No. 4983, Seq. ID No. 4993, Seq.  
ID No. 5011, Seq. ID No. 5023, Seq. ID No. 5031, Seq. ID No. 5033, Seq. ID No.  
5035, Seq. ID No. 5043, Seq. ID No. 5061, Seq. ID No. 5063, Seq. ID No. 5069,  
20 Seq. ID No. 5103, Seq. ID No. 5121, Seq. ID No. 5123, Seq. ID No. 5131, Seq.  
ID No. 5133, Seq. ID No. 5135, Seq. ID No. 5137, Seq. ID No. 5139, Seq. ID No.  
5141, Seq. ID No. 5151, Seq. ID No. 5159, Seq. ID No. 5161, Seq. ID No. 5165,  
Seq. ID No. 5167, Seq. ID No. 5175, Seq. ID No. 5177, Seq. ID No. 5205, Seq.  
ID No. 5207, Seq. ID No. 5211, Seq. ID No. 5215, Seq. ID No. 5219, Seq. ID No.  
25 5223, Seq. ID No. 5285, Seq. ID No. 5287, Seq. ID No. 5329, Seq. ID No. 5331,  
Seq. ID No. 5377, Seq. ID No. 5379, Seq. ID No. 5381, Seq. ID No. 5385, Seq.  
ID No. 5405, Seq. ID No. 5407, Seq. ID No. 5453, Seq. ID No. 5459, Seq. ID No.  
5461, Seq. ID No. 5463, Seq. ID No. 5481, Seq. ID No. 5509, Seq. ID No. 5529,  
Seq. ID No. 5531, Seq. ID No. 5557, Seq. ID No. 5569, Seq. ID No. 5577, Seq.  
30 ID No. 5623, Seq. ID No. 5625, Seq. ID No. 5643, Seq. ID No. 5659, Seq. ID No.  
5661, Seq. ID No. 5683, Seq. ID No. 5685, Seq. ID No. 5709, Seq. ID No. 5711,  
Seq. ID No. 5733, Seq. ID No. 5739, Seq. ID No. 5765, Seq. ID No. 5797, Seq.  
ID No. 5827, Seq. ID No. 5889, Seq. ID No. 5893, Seq. ID No. 5905, Seq. ID No.

5909, Seq. ID No. 5911, Seq. ID No. 5923, Seq. ID No. 5963, Seq. ID No. 5965,  
 Seq. ID No. 6025, Seq. ID No. 6027, Seq. ID No. 6031, Seq. ID No. 6043, Seq.  
 ID No. 6045, Seq. ID No. 6047, Seq. ID No. 6053, Seq. ID No. 6059, Seq. ID No.  
 6109, Seq. ID No. 6111, Seq. ID No. 6115, Seq. ID No. 6117, Seq. ID No. 6127,  
 5 Seq. ID No. 6131, Seq. ID No. 6135, Seq. ID No. 6137, Seq. ID No. 6161, Seq.  
 ID No. 6165, Seq. ID No. 6183, Seq. ID No. 6189, Seq. ID No. 6191, Seq. ID No.  
 6193, Seq. ID No. 6207, Seq. ID No. 6209, Seq. ID No. 6217, Seq. ID No. 6225,  
 Seq. ID No. 6235, Seq. ID No. 6243, Seq. ID No. 6249, Seq. ID No. 6253, Seq.  
 ID No. 6259, Seq. ID No. 6265, Seq. ID No. 6267, Seq. ID No. 6275, Seq. ID No.  
 10 6283, Seq. ID No. 6285, Seq. ID No. 6303, Seq. ID No. 6325, Seq. ID No. 6327,  
 Seq. ID No. 6363, Seq. ID No. 6365, Seq. ID No. 6367, Seq. ID No. 6385, Seq.  
 ID No. 6425, Seq. ID No. 6427, Seq. ID No. 6429, Seq. ID No. 6431, Seq. ID No.  
 6453, Seq. ID No. 6465, Seq. ID No. 6469, Seq. ID No. 6471, Seq. ID No. 6479,  
 Seq. ID No. 6539, Seq. ID No. 6541, Seq. ID No. 6571, Seq. ID No. 6573, Seq.  
 15 ID No. 6639, Seq. ID No. 6643, and Seq. ID No. 6645.

14. The polynucleotide of claim 7 wherein the polynucleotide encodes a polypeptide,  
 which is predicted by HMM Signal P algorithm analysis as having a signal  
 peptide, and the polynucleotide is selected from one of Seq. ID No. 3, Seq. ID  
 20 No. 7, Seq. ID No. 9, Seq. ID No. 19, Seq. ID No. 21, Seq. ID No. 31, Seq. ID No.  
 33, Seq. ID No. 45, Seq. ID No. 47, Seq. ID No. 49, Seq. ID No. 53, Seq. ID No.  
 65, Seq. ID No. 67, Seq. ID No. 85, Seq. ID No. 87, Seq. ID No. 105, Seq. ID No.  
 111, Seq. ID No. 123, Seq. ID No. 131, Seq. ID No. 133, Seq. ID No. 141, Seq.  
 ID No. 159, Seq. ID No. 161, Seq. ID No. 163, Seq. ID No. 171, Seq. ID No. 191,  
 25 Seq. ID No. 209, Seq. ID No. 211, Seq. ID No. 213, Seq. ID No. 215, Seq. ID No.  
 217, Seq. ID No. 225, Seq. ID No. 235, Seq. ID No. 237, Seq. ID No. 249, Seq.  
 ID No. 251, Seq. ID No. 255, Seq. ID No. 257, Seq. ID No. 259, Seq. ID No. 271,  
 Seq. ID No. 273, Seq. ID No. 277, Seq. ID No. 285, Seq. ID No. 287, Seq. ID No.  
 289, Seq. ID No. 327, Seq. ID No. 329, Seq. ID No. 357, Seq. ID No. 359, Seq.  
 30 ID No. 373, Seq. ID No. 375, Seq. ID No. 393, Seq. ID No. 401, Seq. ID No. 403,  
 Seq. ID No. 455, Seq. ID No. 457, Seq. ID No. 477, Seq. ID No. 487, Seq. ID No.  
 489, Seq. ID No. 491, Seq. ID No. 493, Seq. ID No. 495, Seq. ID No. 497, Seq.  
 ID No. 499, Seq. ID No. 503, Seq. ID No. 505, Seq. ID No. 509, Seq. ID No. 511,

Seq. ID No. 513, Seq. ID No. 515, Seq. ID No. 525, Seq. ID No. 527, Seq. ID No. 545, Seq. ID No. 547, Seq. ID No. 549, Seq. ID No. 557, Seq. ID No. 567, Seq. ID No. 569, Seq. ID No. 575, Seq. ID No. 577, Seq. ID No. 579, Seq. ID No. 591, Seq. ID No. 593, Seq. ID No. 599, Seq. ID No. 617, Seq. ID No. 637, Seq. ID No. 639, Seq. ID No. 641, Seq. ID No. 643, Seq. ID No. 645, Seq. ID No. 647, Seq. ID No. 653, Seq. ID No. 655, Seq. ID No. 657, Seq. ID No. 659, Seq. ID No. 661, Seq. ID No. 667, Seq. ID No. 669, Seq. ID No. 675, Seq. ID No. 677, Seq. ID No. 679, Seq. ID No. 715, Seq. ID No. 717, Seq. ID No. 719, Seq. ID No. 721, Seq. ID No. 723, Seq. ID No. 725, Seq. ID No. 745, Seq. ID No. 747, Seq. ID No. 749, Seq. ID No. 751, Seq. ID No. 755, Seq. ID No. 757, Seq. ID No. 759, Seq. ID No. 761, Seq. ID No. 763, Seq. ID No. 765, Seq. ID No. 769, Seq. ID No. 777, Seq. ID No. 779, Seq. ID No. 781, Seq. ID No. 807, Seq. ID No. 809, Seq. ID No. 819, Seq. ID No. 825, Seq. ID No. 863, Seq. ID No. 893, Seq. ID No. 901, Seq. ID No. 935, Seq. ID No. 937, Seq. ID No. 941, Seq. ID No. 943, Seq. ID No. 955, Seq. ID No. 957, Seq. ID No. 967, Seq. ID No. 979, Seq. ID No. 981, Seq. ID No. 983, Seq. ID No. 985, Seq. ID No. 1001, Seq. ID No. 1003, Seq. ID No. 1005, Seq. ID No. 1007, Seq. ID No. 1009, Seq. ID No. 1011, Seq. ID No. 1013, Seq. ID No. 1015, Seq. ID No. 1019, Seq. ID No. 1029, Seq. ID No. 1031, Seq. ID No. 1033, Seq. ID No. 1035, Seq. ID No. 1037, Seq. ID No. 1039, Seq. ID No. 1045, Seq. ID No. 1055, Seq. ID No. 1075, Seq. ID No. 1077, Seq. ID No. 1105, Seq. ID No. 1107, Seq. ID No. 1131, Seq. ID No. 1135, Seq. ID No. 1137, Seq. ID No. 1139, Seq. ID No. 1151, Seq. ID No. 1165, Seq. ID No. 1167, Seq. ID No. 1169, Seq. ID No. 1173, Seq. ID No. 1183, Seq. ID No. 1195, Seq. ID No. 1197, Seq. ID No. 1203, Seq. ID No. 1213, Seq. ID No. 1223, Seq. ID No. 1227, Seq. ID No. 1229, Seq. ID No. 1237, Seq. ID No. 1243, Seq. ID No. 1245, Seq. ID No. 1259, Seq. ID No. 1265, Seq. ID No. 1267, Seq. ID No. 1269, Seq. ID No. 1271, Seq. ID No. 1283, Seq. ID No. 1287, Seq. ID No. 1289, Seq. ID No. 1291, Seq. ID No. 1295, Seq. ID No. 1297, Seq. ID No. 1303, Seq. ID No. 1305, Seq. ID No. 1315, Seq. ID No. 1317, Seq. ID No. 1319, Seq. ID No. 1325, Seq. ID No. 1327, Seq. ID No. 1329, Seq. ID No. 1331, Seq. ID No. 1337, Seq. ID No. 1341, Seq. ID No. 1343, Seq. ID No. 1347, Seq. ID No. 1349, Seq. ID No. 1351, Seq. ID No. 1353, Seq. ID No. 1365, Seq. ID No. 1367, Seq. ID No. 1369, Seq. ID No. 1371, Seq. ID No. 1381, Seq. ID No. 1401, Seq. ID No. 1429, Seq. ID No. 1435, Seq. ID No. 1445,

Seq. ID No. 1447, Seq. ID No. 1481, Seq. ID No. 1513, Seq. ID No. 1515, Seq.  
ID No. 1517, Seq. ID No. 1529, Seq. ID No. 1533, Seq. ID No. 1535, Seq. ID No.  
1545, Seq. ID No. 1547, Seq. ID No. 1551, Seq. ID No. 1553, Seq. ID No. 1559,  
Seq. ID No. 1561, Seq. ID No. 1563, Seq. ID No. 1571, Seq. ID No. 1579, Seq.  
5 ID No. 1583, Seq. ID No. 1585, Seq. ID No. 1621, Seq. ID No. 1633, Seq. ID No.  
1639, Seq. ID No. 1643, Seq. ID No. 1645, Seq. ID No. 1647, Seq. ID No. 1649,  
Seq. ID No. 1653, Seq. ID No. 1661, Seq. ID No. 1663, Seq. ID No. 1665, Seq.  
ID No. 1671, Seq. ID No. 1673, Seq. ID No. 1677, Seq. ID No. 1679, Seq. ID No.  
1681, Seq. ID No. 1693, Seq. ID No. 1707, Seq. ID No. 1711, Seq. ID No. 1731,  
10 Seq. ID No. 1733, Seq. ID No. 1737, Seq. ID No. 1753, Seq. ID No. 1755, Seq.  
ID No. 1757, Seq. ID No. 1765, Seq. ID No. 1767, Seq. ID No. 1771, Seq. ID No.  
1781, Seq. ID No. 1787, Seq. ID No. 1791, Seq. ID No. 1797, Seq. ID No. 1805,  
Seq. ID No. 1819, Seq. ID No. 1821, Seq. ID No. 1823, Seq. ID No. 1839, Seq.  
ID No. 1857, Seq. ID No. 1869, Seq. ID No. 1875, Seq. ID No. 1891, Seq. ID No.  
15 1893, Seq. ID No. 1895, Seq. ID No. 1915, Seq. ID No. 1917, Seq. ID No. 1919,  
Seq. ID No. 1923, Seq. ID No. 1927, Seq. ID No. 1929, Seq. ID No. 1969, Seq.  
ID No. 1981, Seq. ID No. 1991, Seq. ID No. 1993, Seq. ID No. 2005, Seq. ID No.  
2013, Seq. ID No. 2017, Seq. ID No. 2019, Seq. ID No. 2025, Seq. ID No. 2027,  
Seq. ID No. 2033, Seq. ID No. 2035, Seq. ID No. 2041, Seq. ID No. 2049, Seq.  
20 ID No. 2053, Seq. ID No. 2055, Seq. ID No. 2087, Seq. ID No. 2089, Seq. ID No.  
2091, Seq. ID No. 2105, Seq. ID No. 2107, Seq. ID No. 2109, Seq. ID No. 2113,  
Seq. ID No. 2115, Seq. ID No. 2121, Seq. ID No. 2123, Seq. ID No. 2125, Seq.  
ID No. 2127, Seq. ID No. 2149, Seq. ID No. 2151, Seq. ID No. 2155, Seq. ID No.  
2157, Seq. ID No. 2159, Seq. ID No. 2171, Seq. ID No. 2173, Seq. ID No. 2177,  
25 Seq. ID No. 2187, Seq. ID No. 2191, Seq. ID No. 2205, Seq. ID No. 2237, Seq.  
ID No. 2239, Seq. ID No. 2245, Seq. ID No. 2249, Seq. ID No. 2251, Seq. ID No.  
2255, Seq. ID No. 2259, Seq. ID No. 2271, Seq. ID No. 2283, Seq. ID No. 2289,  
Seq. ID No. 2291, Seq. ID No. 2293, Seq. ID No. 2295, Seq. ID No. 2303, Seq.  
ID No. 2305, Seq. ID No. 2307, Seq. ID No. 2317, Seq. ID No. 2319, Seq. ID No.  
30 2321, Seq. ID No. 2323, Seq. ID No. 2325, Seq. ID No. 2327, Seq. ID No. 2329,  
Seq. ID No. 2333, Seq. ID No. 2343, Seq. ID No. 2347, Seq. ID No. 2349, Seq.  
ID No. 2351, Seq. ID No. 2353, Seq. ID No. 2355, Seq. ID No. 2357, Seq. ID No.  
2365, Seq. ID No. 2367, Seq. ID No. 2371, Seq. ID No. 2375, Seq. ID No. 2387,

Seq. ID No. 2389, Seq. ID No. 2391, Seq. ID No. 2393, Seq. ID No. 2407, Seq.  
ID No. 2419, Seq. ID No. 2421, Seq. ID No. 2425, Seq. ID No. 2427, Seq. ID No.  
2429, Seq. ID No. 2433, Seq. ID No. 2449, Seq. ID No. 2459, Seq. ID No. 2487,  
Seq. ID No. 2489, Seq. ID No. 2491, Seq. ID No. 2493, Seq. ID No. 2497, Seq.  
5 ID No. 2499, Seq. ID No. 2501, Seq. ID No. 2503, Seq. ID No. 2507, Seq. ID No.  
2515, Seq. ID No. 2517, Seq. ID No. 2523, Seq. ID No. 2525, Seq. ID No. 2527,  
Seq. ID No. 2531, Seq. ID No. 2533, Seq. ID No. 2535, Seq. ID No. 2537, Seq.  
ID No. 2541, Seq. ID No. 2543, Seq. ID No. 2545, Seq. ID No. 2555, Seq. ID No.  
2557, Seq. ID No. 2565, Seq. ID No. 2569, Seq. ID No. 2571, Seq. ID No. 2583,  
10 Seq. ID No. 2591, Seq. ID No. 2597, Seq. ID No. 2599, Seq. ID No. 2601, Seq.  
ID No. 2607, Seq. ID No. 2611, Seq. ID No. 2621, Seq. ID No. 2627, Seq. ID No.  
2629, Seq. ID No. 2651, Seq. ID No. 2679, Seq. ID No. 2681, Seq. ID No. 2683,  
Seq. ID No. 2691, Seq. ID No. 2693, Seq. ID No. 2695, Seq. ID No. 2697, Seq.  
ID No. 2699, Seq. ID No. 2701, Seq. ID No. 2703, Seq. ID No. 2705, Seq. ID No.  
15 2707, Seq. ID No. 2717, Seq. ID No. 2729, Seq. ID No. 2731, Seq. ID No. 2733,  
Seq. ID No. 2783, Seq. ID No. 2785, Seq. ID No. 2801, Seq. ID No. 2809, Seq.  
ID No. 2813, Seq. ID No. 2815, Seq. ID No. 2819, Seq. ID No. 2821, Seq. ID No.  
2823, Seq. ID No. 2831, Seq. ID No. 2833, Seq. ID No. 2835, Seq. ID No. 2837,  
Seq. ID No. 2839, Seq. ID No. 2841, Seq. ID No. 2845, Seq. ID No. 2853, Seq.  
20 ID No. 2855, Seq. ID No. 2859, Seq. ID No. 2861, Seq. ID No. 2873, Seq. ID No.  
2881, Seq. ID No. 2893, Seq. ID No. 2905, Seq. ID No. 2935, Seq. ID No. 2937,  
Seq. ID No. 2939, Seq. ID No. 2941, Seq. ID No. 2947, Seq. ID No. 2949, Seq.  
ID No. 2951, Seq. ID No. 2969, Seq. ID No. 2973, Seq. ID No. 2975, Seq. ID No.  
2977, Seq. ID No. 2981, Seq. ID No. 2983, Seq. ID No. 2987, Seq. ID No. 2991,  
25 Seq. ID No. 2995, Seq. ID No. 2997, Seq. ID No. 3005, Seq. ID No. 3007, Seq.  
ID No. 3009, Seq. ID No. 3011, Seq. ID No. 3013, Seq. ID No. 3023, Seq. ID No.  
3025, Seq. ID No. 3027, Seq. ID No. 3029, Seq. ID No. 3031, Seq. ID No. 3043,  
Seq. ID No. 3055, Seq. ID No. 3063, Seq. ID No. 3071, Seq. ID No. 3073, Seq.  
ID No. 3075, Seq. ID No. 3077, Seq. ID No. 3119, Seq. ID No. 3121, Seq. ID No.  
30 3123, Seq. ID No. 3145, Seq. ID No. 3155, Seq. ID No. 3157, Seq. ID No. 3163,  
Seq. ID No. 3165, Seq. ID No. 3173, Seq. ID No. 3183, Seq. ID No. 3193, Seq.  
ID No. 3201, Seq. ID No. 3213, Seq. ID No. 3215, Seq. ID No. 3217, Seq. ID No.  
3219, Seq. ID No. 3241, Seq. ID No. 3243, Seq. ID No. 3245, Seq. ID No. 3249,



Seq. ID No. 3255, Seq. ID No. 3257, Seq. ID No. 3261, Seq. ID No. 3263, Seq.  
ID No. 3269, Seq. ID No. 3275, Seq. ID No. 3277, Seq. ID No. 3297, Seq. ID No.  
3317, Seq. ID No. 3323, Seq. ID No. 3325, Seq. ID No. 3331, Seq. ID No. 3335,  
Seq. ID No. 3337, Seq. ID No. 3339, Seq. ID No. 3349, Seq. ID No. 3351, Seq.  
5 ID No. 3353, Seq. ID No. 3355, Seq. ID No. 3357, Seq. ID No. 3359, Seq. ID No.  
3375, Seq. ID No. 3377, Seq. ID No. 3389, Seq. ID No. 3391, Seq. ID No. 3395,  
Seq. ID No. 3405, Seq. ID No. 3415, Seq. ID No. 3421, Seq. ID No. 3425, Seq.  
ID No. 3427, Seq. ID No. 3433, Seq. ID No. 3441, Seq. ID No. 3449, Seq. ID No.  
3451, Seq. ID No. 3453, Seq. ID No. 3455, Seq. ID No. 3457, Seq. ID No. 3463,  
10 Seq. ID No. 3481, Seq. ID No. 3491, Seq. ID No. 3493, Seq. ID No. 3503, Seq.  
ID No. 3505, Seq. ID No. 3517, Seq. ID No. 3519, Seq. ID No. 3527, Seq. ID No.  
3531, Seq. ID No. 3539, Seq. ID No. 3561, Seq. ID No. 3573, Seq. ID No. 3581,  
Seq. ID No. 3587, Seq. ID No. 3593, Seq. ID No. 3595, Seq. ID No. 3611, Seq.  
ID No. 3617, Seq. ID No. 3619, Seq. ID No. 3621, Seq. ID No. 3625, Seq. ID No.  
15 3629, Seq. ID No. 3635, Seq. ID No. 3677, Seq. ID No. 3679, Seq. ID No. 3689,  
Seq. ID No. 3717, Seq. ID No. 3723, Seq. ID No. 3727, Seq. ID No. 3741, Seq.  
ID No. 3745, Seq. ID No. 3753, Seq. ID No. 3755, Seq. ID No. 3757, Seq. ID No.  
3761, Seq. ID No. 3763, Seq. ID No. 3765, Seq. ID No. 3781, Seq. ID No. 3783,  
Seq. ID No. 3793, Seq. ID No. 3799, Seq. ID No. 3807, Seq. ID No. 3813, Seq.  
20 ID No. 3815, Seq. ID No. 3817, Seq. ID No. 3837, Seq. ID No. 3839, Seq. ID No.  
3849, Seq. ID No. 3851, Seq. ID No. 3853, Seq. ID No. 3859, Seq. ID No. 3861,  
Seq. ID No. 3863, Seq. ID No. 3865, Seq. ID No. 3879, Seq. ID No. 3889, Seq.  
ID No. 3891, Seq. ID No. 3895, Seq. ID No. 3903, Seq. ID No. 3915, Seq. ID No.  
3923, Seq. ID No. 3925, Seq. ID No. 3959, Seq. ID No. 3963, Seq. ID No. 3973,  
25 Seq. ID No. 3975, Seq. ID No. 3993, Seq. ID No. 3995, Seq. ID No. 3997, Seq.  
ID No. 4005, Seq. ID No. 4007, Seq. ID No. 4009, Seq. ID No. 4025, Seq. ID No.  
4027, Seq. ID No. 4039, Seq. ID No. 4041, Seq. ID No. 4043, Seq. ID No. 4045,  
Seq. ID No. 4047, Seq. ID No. 4049, Seq. ID No. 4061, Seq. ID No. 4071, Seq.  
ID No. 4073, Seq. ID No. 4079, Seq. ID No. 4081, Seq. ID No. 4083, Seq. ID No.  
30 4101, Seq. ID No. 4103, Seq. ID No. 4111, Seq. ID No. 4133, Seq. ID No. 4135,  
Seq. ID No. 4137, Seq. ID No. 4139, Seq. ID No. 4141, Seq. ID No. 4143, Seq.  
ID No. 4145, Seq. ID No. 4151, Seq. ID No. 4153, Seq. ID No. 4181, Seq. ID No.  
4221, Seq. ID No. 4223, Seq. ID No. 4225, Seq. ID No. 4227, Seq. ID No. 4231,

Seq. ID No. 4233, Seq. ID No. 4241, Seq. ID No. 4247, Seq. ID No. 4253, Seq.  
ID No. 4257, Seq. ID No. 4259, Seq. ID No. 4261, Seq. ID No. 4263, Seq. ID No.  
4265, Seq. ID No. 4269, Seq. ID No. 4275, Seq. ID No. 4285, Seq. ID No. 4287,  
Seq. ID No. 4297, Seq. ID No. 4307, Seq. ID No. 4311, Seq. ID No. 4313, Seq.  
5 ID No. 4343, Seq. ID No. 4379, Seq. ID No. 4385, Seq. ID No. 4389, Seq. ID No.  
4391, Seq. ID No. 4399, Seq. ID No. 4403, Seq. ID No. 4437, Seq. ID No. 4439,  
Seq. ID No. 4441, Seq. ID No. 4469, Seq. ID No. 4473, Seq. ID No. 4481, Seq.  
ID No. 4483, Seq. ID No. 4485, Seq. ID No. 4493, Seq. ID No. 4495, Seq. ID No.  
4497, Seq. ID No. 4513, Seq. ID No. 4515, Seq. ID No. 4527, Seq. ID No. 4529,  
10 Seq. ID No. 4533, Seq. ID No. 4587, Seq. ID No. 4589, Seq. ID No. 4639, Seq.  
ID No. 4641, Seq. ID No. 4643, Seq. ID No. 4659, Seq. ID No. 4681, Seq. ID No.  
4687, Seq. ID No. 4695, Seq. ID No. 4705, Seq. ID No. 4707, Seq. ID No. 4709,  
Seq. ID No. 4711, Seq. ID No. 4715, Seq. ID No. 4717, Seq. ID No. 4737, Seq.  
ID No. 4759, Seq. ID No. 4813, Seq. ID No. 4827, Seq. ID No. 4853, Seq. ID No.  
15 4863, Seq. ID No. 4869, Seq. ID No. 4871, Seq. ID No. 4873, Seq. ID No. 4875,  
Seq. ID No. 4919, Seq. ID No. 4921, Seq. ID No. 4923, Seq. ID No. 4929, Seq.  
ID No. 4931, Seq. ID No. 4949, Seq. ID No. 4951, Seq. ID No. 4975, Seq. ID No.  
4987, Seq. ID No. 4999, Seq. ID No. 5013, Seq. ID No. 5031, Seq. ID No. 5061,  
Seq. ID No. 5063, Seq. ID No. 5069, Seq. ID No. 5085, Seq. ID No. 5103, Seq.  
20 ID No. 5115, Seq. ID No. 5123, Seq. ID No. 5125, Seq. ID No. 5129, Seq. ID No.  
5131, Seq. ID No. 5133, Seq. ID No. 5135, Seq. ID No. 5137, Seq. ID No. 5139,  
Seq. ID No. 5141, Seq. ID No. 5159, Seq. ID No. 5165, Seq. ID No. 5175, Seq.  
ID No. 5197, Seq. ID No. 5199, Seq. ID No. 5205, Seq. ID No. 5207, Seq. ID No.  
5213, Seq. ID No. 5219, Seq. ID No. 5223, Seq. ID No. 5267, Seq. ID No. 5273,  
25 Seq. ID No. 5275, Seq. ID No. 5277, Seq. ID No. 5279, Seq. ID No. 5281, Seq.  
ID No. 5285, Seq. ID No. 5327, Seq. ID No. 5329, Seq. ID No. 5331, Seq. ID No.  
5341, Seq. ID No. 5377, Seq. ID No. 5379, Seq. ID No. 5385, Seq. ID No. 5387,  
Seq. ID No. 5405, Seq. ID No. 5413, Seq. ID No. 5415, Seq. ID No. 5433, Seq.  
ID No. 5453, Seq. ID No. 5459, Seq. ID No. 5461, Seq. ID No. 5463, Seq. ID No.  
30 5465, Seq. ID No. 5491, Seq. ID No. 5497, Seq. ID No. 5509, Seq. ID No. 5513,  
Seq. ID No. 5515, Seq. ID No. 5517, Seq. ID No. 5525, Seq. ID No. 5529, Seq.  
ID No. 5531, Seq. ID No. 5533, Seq. ID No. 5543, Seq. ID No. 5545, Seq. ID No.  
5569, Seq. ID No. 5587, Seq. ID No. 5589, Seq. ID No. 5591, Seq. ID No. 5593,

Seq. ID No. 5595, Seq. ID No. 5597, Seq. ID No. 5609, Seq. ID No. 5611, Seq.  
ID No. 5621, Seq. ID No. 5623, Seq. ID No. 5625, Seq. ID No. 5633, Seq. ID No.  
5637, Seq. ID No. 5639, Seq. ID No. 5641, Seq. ID No. 5643, Seq. ID No. 5649,  
Seq. ID No. 5659, Seq. ID No. 5667, Seq. ID No. 5681, Seq. ID No. 5683, Seq.  
5 ID No. 5685, Seq. ID No. 5687, Seq. ID No. 5689, Seq. ID No. 5699, Seq. ID No.  
5703, Seq. ID No. 5705, Seq. ID No. 5709, Seq. ID No. 5711, Seq. ID No. 5719,  
Seq. ID No. 5729, Seq. ID No. 5733, Seq. ID No. 5735, Seq. ID No. 5739, Seq.  
ID No. 5763, Seq. ID No. 5765, Seq. ID No. 5767, Seq. ID No. 5771, Seq. ID No.  
5783, Seq. ID No. 5785, Seq. ID No. 5791, Seq. ID No. 5797, Seq. ID No. 5829,  
10 Seq. ID No. 5879, Seq. ID No. 5883, Seq. ID No. 5885, Seq. ID No. 5889, Seq.  
ID No. 5893, Seq. ID No. 5895, Seq. ID No. 5899, Seq. ID No. 5901, Seq. ID No.  
5905, Seq. ID No. 5909, Seq. ID No. 5921, Seq. ID No. 5923, Seq. ID No. 5927,  
Seq. ID No. 5929, Seq. ID No. 5939, Seq. ID No. 6023, Seq. ID No. 6025, Seq.  
ID No. 6027, Seq. ID No. 6043, Seq. ID No. 6047, Seq. ID No. 6053, Seq. ID No.  
15 6059, Seq. ID No. 6063, Seq. ID No. 6067, Seq. ID No. 6087, Seq. ID No. 6089,  
Seq. ID No. 6091, Seq. ID No. 6095, Seq. ID No. 6103, Seq. ID No. 6107, Seq.  
ID No. 6109, Seq. ID No. 6111, Seq. ID No. 6115, Seq. ID No. 6117, Seq. ID No.  
6135, Seq. ID No. 6137, Seq. ID No. 6159, Seq. ID No. 6161, Seq. ID No. 6163,  
Seq. ID No. 6165, Seq. ID No. 6169, Seq. ID No. 6183, Seq. ID No. 6185, Seq.  
20 ID No. 6187, Seq. ID No. 6189, Seq. ID No. 6191, Seq. ID No. 6197, Seq. ID No.  
6203, Seq. ID No. 6205, Seq. ID No. 6209, Seq. ID No. 6217, Seq. ID No. 6221,  
Seq. ID No. 6223, Seq. ID No. 6225, Seq. ID No. 6227, Seq. ID No. 6229, Seq.  
ID No. 6235, Seq. ID No. 6237, Seq. ID No. 6241, Seq. ID No. 6243, Seq. ID No.  
6245, Seq. ID No. 6249, Seq. ID No. 6253, Seq. ID No. 6259, Seq. ID No. 6263,  
25 Seq. ID No. 6265, Seq. ID No. 6267, Seq. ID No. 6273, Seq. ID No. 6275, Seq.  
ID No. 6283, Seq. ID No. 6285, Seq. ID No. 6289, Seq. ID No. 6301, Seq. ID No.  
6303, Seq. ID No. 6325, Seq. ID No. 6327, Seq. ID No. 6363, Seq. ID No. 6365,  
Seq. ID No. 6377, Seq. ID No. 6381, Seq. ID No. 6383, Seq. ID No. 6415, Seq.  
ID No. 6425, Seq. ID No. 6427, Seq. ID No. 6429, Seq. ID No. 6431, Seq. ID No.  
30 6473, Seq. ID No. 6479, Seq. ID No. 6497, Seq. ID No. 6517, Seq. ID No. 6541,  
Seq. ID No. 6543, Seq. ID No. 6555, Seq. ID No. 6557, Seq. ID No. 6571, Seq.  
ID No. 6573, Seq. ID No. 6581, Seq. ID No. 6593, Seq. ID No. 6595, Seq. ID No.  
6597, Seq. ID No. 6599, Seq. ID No. 6601, Seq. ID No. 6603, Seq. ID No. 6631,

Seq. ID No. 6637, Seq. ID No. 6639, Seq. ID No. 6643, Seq. ID No. 6645, and Seq. ID No. 6649.

15. The polynucleotide of claim 7, wherein the polynucleotide encodes a polypeptide,  
5 which is predicted by HMM Signal P algorithm analysis as being a non-secretory protein, and the polynucleotide is selected from one of Seq. ID No. 1, Seq. ID No. 5, Seq. ID No. 11, Seq. ID No. 13, Seq. ID No. 15, Seq. ID No. 17, Seq. ID No. 23, Seq. ID No. 25, Seq. ID No. 27, Seq. ID No. 29, Seq. ID No. 35, Seq. ID No. 37, Seq. ID No. 39, Seq. ID No. 41, Seq. ID No. 43, Seq. ID No. 51, Seq. ID No. 55, Seq. ID No. 57, Seq. ID No. 59, Seq. ID No. 61, Seq. ID No. 63, Seq. ID No. 69, Seq. ID No. 71, Seq. ID No. 73, Seq. ID No. 75, Seq. ID No. 77, Seq. ID No. 79, Seq. ID No. 81, Seq. ID No. 83, Seq. ID No. 89, Seq. ID No. 91, Seq. ID No. 93, Seq. ID No. 95, Seq. ID No. 97, Seq. ID No. 99, Seq. ID No. 101, Seq. ID No. 103, Seq. ID No. 107, Seq. ID No. 109, Seq. ID No. 113, Seq. ID No. 115, Seq. ID No. 117, Seq. ID No. 119, Seq. ID No. 121, Seq. ID No. 125, Seq. ID No. 127, Seq. ID No. 129, Seq. ID No. 135, Seq. ID No. 137, Seq. ID No. 139, Seq. ID No. 143, Seq. ID No. 145, Seq. ID No. 147, Seq. ID No. 149, Seq. ID No. 151, Seq. ID No. 153, Seq. ID No. 155, Seq. ID No. 157, Seq. ID No. 165, Seq. ID No. 167, Seq. ID No. 169, Seq. ID No. 173, Seq. ID No. 175, Seq. ID No. 177, Seq. ID No. 179, Seq. ID No. 181, Seq. ID No. 183, Seq. ID No. 185, Seq. ID No. 187, Seq. ID No. 189, Seq. ID No. 193, Seq. ID No. 195, Seq. ID No. 197, Seq. ID No. 199, Seq. ID No. 201, Seq. ID No. 203, Seq. ID No. 205, Seq. ID No. 207, Seq. ID No. 219, Seq. ID No. 221, Seq. ID No. 223, Seq. ID No. 227, Seq. ID No. 229, Seq. ID No. 231, Seq. ID No. 233, Seq. ID No. 239, Seq. ID No. 241, Seq. ID No. 243, Seq. ID No. 245, Seq. ID No. 247, Seq. ID No. 253, Seq. ID No. 261, Seq. ID No. 263, Seq. ID No. 265, Seq. ID No. 267, Seq. ID No. 269, Seq. ID No. 275, Seq. ID No. 279, Seq. ID No. 281, Seq. ID No. 283, Seq. ID No. 291, Seq. ID No. 293, Seq. ID No. 295, Seq. ID No. 297, Seq. ID No. 299, Seq. ID No. 301, Seq. ID No. 303, Seq. ID No. 305, Seq. ID No. 307, Seq. ID No. 309, Seq. ID No. 311, Seq. ID No. 313, Seq. ID No. 315, Seq. ID No. 317, Seq. ID No. 319, Seq. ID No. 321, Seq. ID No. 323, Seq. ID No. 325, Seq. ID No. 331, Seq. ID No. 333, Seq. ID No. 335, Seq. ID No. 337, Seq. ID No. 339, Seq. ID No. 341, Seq. ID No. 343, Seq. ID No. 345, Seq. ID No. 347, Seq. ID No. 349, Seq. ID No. 351, Seq. ID No. 353,

Seq. ID No. 355, Seq. ID No. 361, Seq. ID No. 363, Seq. ID No. 365, Seq. ID No. 367, Seq. ID No. 369, Seq. ID No. 371, Seq. ID No. 377, Seq. ID No. 379, Seq. ID No. 381, Seq. ID No. 383, Seq. ID No. 385, Seq. ID No. 387, Seq. ID No. 389, Seq. ID No. 391, Seq. ID No. 395, Seq. ID No. 397, Seq. ID No. 399, Seq. ID No. 405, Seq. ID No. 407, Seq. ID No. 409, Seq. ID No. 411, Seq. ID No. 413, Seq. ID No. 415, Seq. ID No. 417, Seq. ID No. 419, Seq. ID No. 421, Seq. ID No. 423, Seq. ID No. 425, Seq. ID No. 427, Seq. ID No. 429, Seq. ID No. 431, Seq. ID No. 433, Seq. ID No. 435, Seq. ID No. 437, Seq. ID No. 439, Seq. ID No. 441, Seq. ID No. 443, Seq. ID No. 445, Seq. ID No. 447, Seq. ID No. 449, Seq. ID No. 451, Seq. ID No. 453, Seq. ID No. 459, Seq. ID No. 461, Seq. ID No. 463, Seq. ID No. 465, Seq. ID No. 467, Seq. ID No. 469, Seq. ID No. 471, Seq. ID No. 473, Seq. ID No. 475, Seq. ID No. 479, Seq. ID No. 481, Seq. ID No. 483, Seq. ID No. 485, Seq. ID No. 501, Seq. ID No. 507, Seq. ID No. 517, Seq. ID No. 519, Seq. ID No. 521, Seq. ID No. 523, Seq. ID No. 529, Seq. ID No. 531, Seq. ID No. 533, Seq. ID No. 535, Seq. ID No. 537, Seq. ID No. 539, Seq. ID No. 541, Seq. ID No. 543, Seq. ID No. 551, Seq. ID No. 553, Seq. ID No. 555, Seq. ID No. 559, Seq. ID No. 561, Seq. ID No. 563, Seq. ID No. 565, Seq. ID No. 571, Seq. ID No. 573, Seq. ID No. 581, Seq. ID No. 583, Seq. ID No. 585, Seq. ID No. 587, Seq. ID No. 589, Seq. ID No. 595, Seq. ID No. 597, Seq. ID No. 601, Seq. ID No. 603, Seq. ID No. 605, Seq. ID No. 607, Seq. ID No. 609, Seq. ID No. 611, Seq. ID No. 613, Seq. ID No. 615, Seq. ID No. 619, Seq. ID No. 621, Seq. ID No. 623, Seq. ID No. 625, Seq. ID No. 627, Seq. ID No. 629, Seq. ID No. 631, Seq. ID No. 633, Seq. ID No. 635, Seq. ID No. 649, Seq. ID No. 651, Seq. ID No. 663, Seq. ID No. 665, Seq. ID No. 671, Seq. ID No. 673, Seq. ID No. 681, Seq. ID No. 683, Seq. ID No. 685, Seq. ID No. 687, Seq. ID No. 689, Seq. ID No. 691, Seq. ID No. 693, Seq. ID No. 695, Seq. ID No. 697, Seq. ID No. 699, Seq. ID No. 701, Seq. ID No. 703, Seq. ID No. 705, Seq. ID No. 707, Seq. ID No. 709, Seq. ID No. 711, Seq. ID No. 713, Seq. ID No. 727, Seq. ID No. 729, Seq. ID No. 731, Seq. ID No. 733, Seq. ID No. 735, Seq. ID No. 737, Seq. ID No. 739, Seq. ID No. 741, Seq. ID No. 743, Seq. ID No. 753, Seq. ID No. 767, Seq. ID No. 771, Seq. ID No. 773, Seq. ID No. 775, Seq. ID No. 783, Seq. ID No. 785, Seq. ID No. 787, Seq. ID No. 789, Seq. ID No. 791, Seq. ID No. 793, Seq. ID No. 795, Seq. ID No. 797, Seq. ID No. 799, Seq. ID No. 801, Seq. ID No. 803, Seq. ID No. 805, Seq. ID No. 811, Seq. ID No. 813,

Seq. ID No. 815, Seq. ID No. 817, Seq. ID No. 821, Seq. ID No. 823, Seq. ID No. 827, Seq. ID No. 829, Seq. ID No. 831, Seq. ID No. 833, Seq. ID No. 835, Seq. ID No. 837, Seq. ID No. 839, Seq. ID No. 841, Seq. ID No. 843, Seq. ID No. 845, Seq. ID No. 847, Seq. ID No. 849, Seq. ID No. 851, Seq. ID No. 853, Seq. ID No. 855, Seq. ID No. 857, Seq. ID No. 859, Seq. ID No. 861, Seq. ID No. 865, Seq. ID No. 867, Seq. ID No. 869, Seq. ID No. 871, Seq. ID No. 873, Seq. ID No. 875, Seq. ID No. 877, Seq. ID No. 879, Seq. ID No. 881, Seq. ID No. 883, Seq. ID No. 885, Seq. ID No. 887, Seq. ID No. 889, Seq. ID No. 891, Seq. ID No. 895, Seq. ID No. 897, Seq. ID No. 899, Seq. ID No. 903, Seq. ID No. 905, Seq. ID No. 907, Seq. ID No. 909, Seq. ID No. 911, Seq. ID No. 913, Seq. ID No. 915, Seq. ID No. 917, Seq. ID No. 919, Seq. ID No. 921, Seq. ID No. 923, Seq. ID No. 925, Seq. ID No. 927, Seq. ID No. 929, Seq. ID No. 931, Seq. ID No. 933, Seq. ID No. 939, Seq. ID No. 945, Seq. ID No. 947, Seq. ID No. 949, Seq. ID No. 951, Seq. ID No. 953, Seq. ID No. 959, Seq. ID No. 961, Seq. ID No. 963, Seq. ID No. 965, Seq. ID No. 969, Seq. ID No. 971, Seq. ID No. 973, Seq. ID No. 975, Seq. ID No. 977, Seq. ID No. 987, Seq. ID No. 989, Seq. ID No. 991, Seq. ID No. 993, Seq. ID No. 995, Seq. ID No. 997, Seq. ID No. 999, Seq. ID No. 1017, Seq. ID No. 1021, Seq. ID No. 1023, Seq. ID No. 1025, Seq. ID No. 1027, Seq. ID No. 1041, Seq. ID No. 1043, Seq. ID No. 1047, Seq. ID No. 1049, Seq. ID No. 1051, Seq. ID No. 1053, Seq. ID No. 1057, Seq. ID No. 1059, Seq. ID No. 1061, Seq. ID No. 1063, Seq. ID No. 1065, Seq. ID No. 1067, Seq. ID No. 1069, Seq. ID No. 1071, Seq. ID No. 1073, Seq. ID No. 1079, Seq. ID No. 1081, Seq. ID No. 1083, Seq. ID No. 1085, Seq. ID No. 1087, Seq. ID No. 1089, Seq. ID No. 1091, Seq. ID No. 1093, Seq. ID No. 1095, Seq. ID No. 1097, Seq. ID No. 1099, Seq. ID No. 1101, Seq. ID No. 1103, Seq. ID No. 1109, Seq. ID No. 1111, Seq. ID No. 1113, Seq. ID No. 1115, Seq. ID No. 1117, Seq. ID No. 1119, Seq. ID No. 1121, Seq. ID No. 1123, Seq. ID No. 1125, Seq. ID No. 1127, Seq. ID No. 1129, Seq. ID No. 1133, Seq. ID No. 1141, Seq. ID No. 1143, Seq. ID No. 1145, Seq. ID No. 1147, Seq. ID No. 1149, Seq. ID No. 1153, Seq. ID No. 1155, Seq. ID No. 1157, Seq. ID No. 1159, Seq. ID No. 1161, Seq. ID No. 1163, Seq. ID No. 1171, Seq. ID No. 1175, Seq. ID No. 1177, Seq. ID No. 1179, Seq. ID No. 1181, Seq. ID No. 1185, Seq. ID No. 1187, Seq. ID No. 1189, Seq. ID No. 1191, Seq. ID No. 1193, Seq. ID No. 1199, Seq. ID No. 1201, Seq. ID No. 1205, Seq. ID No. 1207, Seq. ID No. 1209, Seq. ID No.

1211, Seq. ID No. 1215, Seq. ID No. 1217, Seq. ID No. 1219, Seq. ID No. 1221,  
Seq. ID No. 1225, Seq. ID No. 1231, Seq. ID No. 1233, Seq. ID No. 1235, Seq.  
ID No. 1239, Seq. ID No. 1241, Seq. ID No. 1247, Seq. ID No. 1249, Seq. ID No.  
1251, Seq. ID No. 1253, Seq. ID No. 1255, Seq. ID No. 1257, Seq. ID No. 1261,  
5 Seq. ID No. 1263, Seq. ID No. 1273, Seq. ID No. 1275, Seq. ID No. 1277, Seq.  
ID No. 1279, Seq. ID No. 1281, Seq. ID No. 1285, Seq. ID No. 1293, Seq. ID No.  
1299, Seq. ID No. 1301, Seq. ID No. 1307, Seq. ID No. 1309, Seq. ID No. 1311,  
Seq. ID No. 1313, Seq. ID No. 1321, Seq. ID No. 1323, Seq. ID No. 1333, Seq.  
ID No. 1335, Seq. ID No. 1339, Seq. ID No. 1345, Seq. ID No. 1355, Seq. ID No.  
10 1357, Seq. ID No. 1359, Seq. ID No. 1361, Seq. ID No. 1363, Seq. ID No. 1373,  
Seq. ID No. 1375, Seq. ID No. 1377, Seq. ID No. 1379, Seq. ID No. 1383, Seq.  
ID No. 1385, Seq. ID No. 1387, Seq. ID No. 1389, Seq. ID No. 1391, Seq. ID No.  
1393, Seq. ID No. 1395, Seq. ID No. 1397, Seq. ID No. 1399, Seq. ID No. 1403,  
Seq. ID No. 1405, Seq. ID No. 1407, Seq. ID No. 1409, Seq. ID No. 1411, Seq.  
15 ID No. 1413, Seq. ID No. 1415, Seq. ID No. 1417, Seq. ID No. 1419, Seq. ID No.  
1421, Seq. ID No. 1423, Seq. ID No. 1425, Seq. ID No. 1427, Seq. ID No. 1431,  
Seq. ID No. 1433, Seq. ID No. 1437, Seq. ID No. 1439, Seq. ID No. 1441, Seq.  
ID No. 1443, Seq. ID No. 1449, Seq. ID No. 1451, Seq. ID No. 1453, Seq. ID No.  
1455, Seq. ID No. 1457, Seq. ID No. 1459, Seq. ID No. 1461, Seq. ID No. 1463,  
20 Seq. ID No. 1465, Seq. ID No. 1467, Seq. ID No. 1469, Seq. ID No. 1471, Seq.  
ID No. 1473, Seq. ID No. 1475, Seq. ID No. 1477, Seq. ID No. 1479, Seq. ID No.  
1483, Seq. ID No. 1485, Seq. ID No. 1487, Seq. ID No. 1489, Seq. ID No. 1491,  
Seq. ID No. 1493, Seq. ID No. 1495, Seq. ID No. 1497, Seq. ID No. 1499, Seq.  
ID No. 1501, Seq. ID No. 1503, Seq. ID No. 1505, Seq. ID No. 1507, Seq. ID No.  
25 1509, Seq. ID No. 1511, Seq. ID No. 1519, Seq. ID No. 1521, Seq. ID No. 1523,  
Seq. ID No. 1525, Seq. ID No. 1527, Seq. ID No. 1531, Seq. ID No. 1537, Seq.  
ID No. 1539, Seq. ID No. 1541, Seq. ID No. 1543, Seq. ID No. 1549, Seq. ID No.  
1555, Seq. ID No. 1557, Seq. ID No. 1565, Seq. ID No. 1567, Seq. ID No. 1569,  
Seq. ID No. 1573, Seq. ID No. 1575, Seq. ID No. 1577, Seq. ID No. 1581, Seq.  
30 ID No. 1587, Seq. ID No. 1589, Seq. ID No. 1591, Seq. ID No. 1593, Seq. ID No.  
1595, Seq. ID No. 1597, Seq. ID No. 1601, Seq. ID No. 1603, Seq. ID No. 1605,  
Seq. ID No. 1607, Seq. ID No. 1609, Seq. ID No. 1611, Seq. ID No. 1613, Seq.  
ID No. 1615, Seq. ID No. 1617, Seq. ID No. 1619, Seq. ID No. 1623, Seq. ID No.

1625, Seq. ID No. 1627, Seq. ID No. 1629, Seq. ID No. 1631, Seq. ID No. 1635,  
Seq. ID No. 1637, Seq. ID No. 1641, Seq. ID No. 1651, Seq. ID No. 1655, Seq.  
ID No. 1657, Seq. ID No. 1659, Seq. ID No. 1667, Seq. ID No. 1669, Seq. ID No.  
1675, Seq. ID No. 1683, Seq. ID No. 1685, Seq. ID No. 1687, Seq. ID No. 1689,  
5 Seq. ID No. 1691, Seq. ID No. 1695, Seq. ID No. 1697, Seq. ID No. 1699, Seq.  
ID No. 1701, Seq. ID No. 1703, Seq. ID No. 1705, Seq. ID No. 1709, Seq. ID No.  
1713, Seq. ID No. 1715, Seq. ID No. 1717, Seq. ID No. 1719, Seq. ID No. 1721,  
Seq. ID No. 1723, Seq. ID No. 1725, Seq. ID No. 1727, Seq. ID No. 1729, Seq.  
ID No. 1735, Seq. ID No. 1739, Seq. ID No. 1741, Seq. ID No. 1743, Seq. ID No.  
10 1745, Seq. ID No. 1747, Seq. ID No. 1749, Seq. ID No. 1751, Seq. ID No. 1759,  
Seq. ID No. 1761, Seq. ID No. 1763, Seq. ID No. 1769, Seq. ID No. 1773, Seq.  
ID No. 1775, Seq. ID No. 1777, Seq. ID No. 1779, Seq. ID No. 1783, Seq. ID No.  
1785, Seq. ID No. 1789, Seq. ID No. 1793, Seq. ID No. 1795, Seq. ID No. 1799,  
Seq. ID No. 1801, Seq. ID No. 1803, Seq. ID No. 1807, Seq. ID No. 1809, Seq.  
15 ID No. 1811, Seq. ID No. 1813, Seq. ID No. 1815, Seq. ID No. 1817, Seq. ID No.  
1825, Seq. ID No. 1827, Seq. ID No. 1829, Seq. ID No. 1831, Seq. ID No. 1833,  
Seq. ID No. 1835, Seq. ID No. 1837, Seq. ID No. 1841, Seq. ID No. 1843, Seq.  
ID No. 1845, Seq. ID No. 1847, Seq. ID No. 1849, Seq. ID No. 1851, Seq. ID No.  
1853, Seq. ID No. 1855, Seq. ID No. 1859, Seq. ID No. 1861, Seq. ID No. 1863,  
20 Seq. ID No. 1865, Seq. ID No. 1867, Seq. ID No. 1871, Seq. ID No. 1873, Seq.  
ID No. 1877, Seq. ID No. 1879, Seq. ID No. 1881, Seq. ID No. 1883, Seq. ID No.  
1885, Seq. ID No. 1887, Seq. ID No. 1889, Seq. ID No. 1897, Seq. ID No. 1899,  
Seq. ID No. 1901, Seq. ID No. 1903, Seq. ID No. 1905, Seq. ID No. 1907, Seq.  
ID No. 1909, Seq. ID No. 1911, Seq. ID No. 1913, Seq. ID No. 1921, Seq. ID No.  
25 1925, Seq. ID No. 1931, Seq. ID No. 1933, Seq. ID No. 1935, Seq. ID No. 1937,  
Seq. ID No. 1939, Seq. ID No. 1941, Seq. ID No. 1943, Seq. ID No. 1945, Seq.  
ID No. 1947, Seq. ID No. 1949, Seq. ID No. 1951, Seq. ID No. 1953, Seq. ID No.  
1955, Seq. ID No. 1957, Seq. ID No. 1959, Seq. ID No. 1961, Seq. ID No. 1963,  
Seq. ID No. 1965, Seq. ID No. 1967, Seq. ID No. 1971, Seq. ID No. 1973, Seq.  
30 ID No. 1975, Seq. ID No. 1977, Seq. ID No. 1979, Seq. ID No. 1983, Seq. ID No.  
1985, Seq. ID No. 1987, Seq. ID No. 1989, Seq. ID No. 1995, Seq. ID No. 1997,  
Seq. ID No. 1999, Seq. ID No. 2001, Seq. ID No. 2003, Seq. ID No. 2007, Seq.  
ID No. 2009, Seq. ID No. 2011, Seq. ID No. 2015, Seq. ID No. 2021, Seq. ID No.



2023, Seq. ID No. 2029, Seq. ID No. 2031, Seq. ID No. 2037, Seq. ID No. 2039,  
Seq. ID No. 2043, Seq. ID No. 2045, Seq. ID No. 2047, Seq. ID No. 2051, Seq.  
ID No. 2057, Seq. ID No. 2059, Seq. ID No. 2061, Seq. ID No. 2063, Seq. ID No.  
2065, Seq. ID No. 2067, Seq. ID No. 2069, Seq. ID No. 2071, Seq. ID No. 2073,  
5 Seq. ID No. 2075, Seq. ID No. 2077, Seq. ID No. 2079, Seq. ID No. 2081, Seq.  
ID No. 2083, Seq. ID No. 2085, Seq. ID No. 2093, Seq. ID No. 2095, Seq. ID No.  
2097, Seq. ID No. 2099, Seq. ID No. 2101, Seq. ID No. 2103, Seq. ID No. 2111,  
Seq. ID No. 2117, Seq. ID No. 2119, Seq. ID No. 2129, Seq. ID No. 2131, Seq.  
ID No. 2133, Seq. ID No. 2135, Seq. ID No. 2137, Seq. ID No. 2139, Seq. ID No.  
10 2141, Seq. ID No. 2143, Seq. ID No. 2145, Seq. ID No. 2147, Seq. ID No. 2153,  
Seq. ID No. 2161, Seq. ID No. 2163, Seq. ID No. 2165, Seq. ID No. 2167, Seq.  
ID No. 2169, Seq. ID No. 2175, Seq. ID No. 2179, Seq. ID No. 2181, Seq. ID No.  
2183, Seq. ID No. 2185, Seq. ID No. 2189, Seq. ID No. 2193, Seq. ID No. 2195,  
Seq. ID No. 2197, Seq. ID No. 2199, Seq. ID No. 2201, Seq. ID No. 2203, Seq.  
15 ID No. 2207, Seq. ID No. 2209, Seq. ID No. 2211, Seq. ID No. 2213, Seq. ID No.  
2215, Seq. ID No. 2217, Seq. ID No. 2219, Seq. ID No. 2221, Seq. ID No. 2223,  
Seq. ID No. 2225, Seq. ID No. 2227, Seq. ID No. 2229, Seq. ID No. 2231, Seq.  
ID No. 2233, Seq. ID No. 2235, Seq. ID No. 2241, Seq. ID No. 2243, Seq. ID No.  
2247, Seq. ID No. 2253, Seq. ID No. 2257, Seq. ID No. 2261, Seq. ID No. 2263,  
20 Seq. ID No. 2265, Seq. ID No. 2267, Seq. ID No. 2269, Seq. ID No. 2273, Seq.  
ID No. 2275, Seq. ID No. 2277, Seq. ID No. 2279, Seq. ID No. 2281, Seq. ID No.  
2285, Seq. ID No. 2287, Seq. ID No. 2297, Seq. ID No. 2299, Seq. ID No. 2301,  
Seq. ID No. 2309, Seq. ID No. 2311, Seq. ID No. 2313, Seq. ID No. 2315, Seq.  
ID No. 2331, Seq. ID No. 2335, Seq. ID No. 2337, Seq. ID No. 2339, Seq. ID No.  
25 2341, Seq. ID No. 2345, Seq. ID No. 2359, Seq. ID No. 2361, Seq. ID No. 2363,  
Seq. ID No. 2369, Seq. ID No. 2373, Seq. ID No. 2377, Seq. ID No. 2379, Seq.  
ID No. 2381, Seq. ID No. 2383, Seq. ID No. 2385, Seq. ID No. 2395, Seq. ID No.  
2397, Seq. ID No. 2399, Seq. ID No. 2401, Seq. ID No. 2403, Seq. ID No. 2405,  
Seq. ID No. 2409, Seq. ID No. 2411, Seq. ID No. 2413, Seq. ID No. 2415, Seq.  
30 ID No. 2417, Seq. ID No. 2423, Seq. ID No. 2431, Seq. ID No. 2435, Seq. ID No.  
2437, Seq. ID No. 2439, Seq. ID No. 2441, Seq. ID No. 2443, Seq. ID No. 2445,  
Seq. ID No. 2447, Seq. ID No. 2451, Seq. ID No. 2453, Seq. ID No. 2455, Seq.  
ID No. 2457, Seq. ID No. 2461, Seq. ID No. 2463, Seq. ID No. 2465, Seq. ID No.

2467, Seq. ID No. 2469, Seq. ID No. 2471, Seq. ID No. 2473, Seq. ID No. 2475,  
Seq. ID No. 2477, Seq. ID No. 2479, Seq. ID No. 2481, Seq. ID No. 2483, Seq.  
ID No. 2485, Seq. ID No. 2495, Seq. ID No. 2505, Seq. ID No. 2509, Seq. ID No.  
2511, Seq. ID No. 2513, Seq. ID No. 2519, Seq. ID No. 2521, Seq. ID No. 2529,  
5 Seq. ID No. 2539, Seq. ID No. 2547, Seq. ID No. 2549, Seq. ID No. 2551, Seq.  
ID No. 2553, Seq. ID No. 2559, Seq. ID No. 2561, Seq. ID No. 2563, Seq. ID No.  
2567, Seq. ID No. 2573, Seq. ID No. 2575, Seq. ID No. 2577, Seq. ID No. 2579,  
Seq. ID No. 2581, Seq. ID No. 2585, Seq. ID No. 2587, Seq. ID No. 2589, Seq.  
ID No. 2593, Seq. ID No. 2595, Seq. ID No. 2603, Seq. ID No. 2605, Seq. ID No.  
10 2609, Seq. ID No. 2613, Seq. ID No. 2615, Seq. ID No. 2617, Seq. ID No. 2619,  
Seq. ID No. 2623, Seq. ID No. 2625, Seq. ID No. 2631, Seq. ID No. 2633, Seq.  
ID No. 2635, Seq. ID No. 2637, Seq. ID No. 2639, Seq. ID No. 2641, Seq. ID No.  
2643, Seq. ID No. 2645, Seq. ID No. 2647, Seq. ID No. 2649, Seq. ID No. 2653,  
Seq. ID No. 2655, Seq. ID No. 2657, Seq. ID No. 2659, Seq. ID No. 2661, Seq.  
15 ID No. 2663, Seq. ID No. 2665, Seq. ID No. 2667, Seq. ID No. 2669, Seq. ID No.  
2671, Seq. ID No. 2673, Seq. ID No. 2675, Seq. ID No. 2677, Seq. ID No. 2685,  
Seq. ID No. 2687, Seq. ID No. 2689, Seq. ID No. 2709, Seq. ID No. 2711, Seq.  
ID No. 2713, Seq. ID No. 2715, Seq. ID No. 2719, Seq. ID No. 2721, Seq. ID No.  
2723, Seq. ID No. 2725, Seq. ID No. 2727, Seq. ID No. 2735, Seq. ID No. 2737,  
20 Seq. ID No. 2739, Seq. ID No. 2741, Seq. ID No. 2743, Seq. ID No. 2745, Seq.  
ID No. 2747, Seq. ID No. 2749, Seq. ID No. 2751, Seq. ID No. 2753, Seq. ID No.  
2755, Seq. ID No. 2757, Seq. ID No. 2759, Seq. ID No. 2761, Seq. ID No. 2763,  
Seq. ID No. 2765, Seq. ID No. 2767, Seq. ID No. 2769, Seq. ID No. 2771, Seq.  
ID No. 2773, Seq. ID No. 2775, Seq. ID No. 2777, Seq. ID No. 2779, Seq. ID No.  
25 2781, Seq. ID No. 2787, Seq. ID No. 2789, Seq. ID No. 2791, Seq. ID No. 2793,  
Seq. ID No. 2795, Seq. ID No. 2797, Seq. ID No. 2799, Seq. ID No. 2803, Seq.  
ID No. 2805, Seq. ID No. 2807, Seq. ID No. 2811, Seq. ID No. 2817, Seq. ID No.  
2825, Seq. ID No. 2827, Seq. ID No. 2829, Seq. ID No. 2843, Seq. ID No. 2847,  
Seq. ID No. 2849, Seq. ID No. 2851, Seq. ID No. 2857, Seq. ID No. 2863, Seq.  
30 ID No. 2865, Seq. ID No. 2867, Seq. ID No. 2869, Seq. ID No. 2871, Seq. ID No.  
2875, Seq. ID No. 2877, Seq. ID No. 2879, Seq. ID No. 2883, Seq. ID No. 2885,  
Seq. ID No. 2887, Seq. ID No. 2889, Seq. ID No. 2891, Seq. ID No. 2895, Seq.  
ID No. 2897, Seq. ID No. 2899, Seq. ID No. 2901, Seq. ID No. 2903, Seq. ID No.

2907, Seq. ID No. 2909, Seq. ID No. 2911, Seq. ID No. 2913, Seq. ID No. 2915,  
Seq. ID No. 2917, Seq. ID No. 2919, Seq. ID No. 2921, Seq. ID No. 2923, Seq.  
ID No. 2925, Seq. ID No. 2927, Seq. ID No. 2929, Seq. ID No. 2931, Seq. ID No.  
2933, Seq. ID No. 2943, Seq. ID No. 2945, Seq. ID No. 2953, Seq. ID No. 2955,  
5 Seq. ID No. 2957, Seq. ID No. 2959, Seq. ID No. 2961, Seq. ID No. 2963, Seq.  
ID No. 2965, Seq. ID No. 2967, Seq. ID No. 2971, Seq. ID No. 2979, Seq. ID No.  
2985, Seq. ID No. 2989, Seq. ID No. 2993, Seq. ID No. 2999, Seq. ID No. 3001,  
Seq. ID No. 3003, Seq. ID No. 3015, Seq. ID No. 3017, Seq. ID No. 3019, Seq.  
ID No. 3021, Seq. ID No. 3033, Seq. ID No. 3035, Seq. ID No. 3037, Seq. ID No.  
10 3039, Seq. ID No. 3041, Seq. ID No. 3045, Seq. ID No. 3047, Seq. ID No. 3049,  
Seq. ID No. 3051, Seq. ID No. 3053, Seq. ID No. 3057, Seq. ID No. 3059, Seq.  
ID No. 3061, Seq. ID No. 3065, Seq. ID No. 3067, Seq. ID No. 3069, Seq. ID No.  
3079, Seq. ID No. 3081, Seq. ID No. 3083, Seq. ID No. 3085, Seq. ID No. 3087,  
Seq. ID No. 3089, Seq. ID No. 3091, Seq. ID No. 3093, Seq. ID No. 3095, Seq.  
15 ID No. 3097, Seq. ID No. 3099, Seq. ID No. 3101, Seq. ID No. 3103, Seq. ID No.  
3105, Seq. ID No. 3107, Seq. ID No. 3109, Seq. ID No. 3111, Seq. ID No. 3113,  
Seq. ID No. 3115, Seq. ID No. 3117, Seq. ID No. 3125, Seq. ID No. 3127, Seq.  
ID No. 3129, Seq. ID No. 3131, Seq. ID No. 3133, Seq. ID No. 3135, Seq. ID No.  
3137, Seq. ID No. 3139, Seq. ID No. 3141, Seq. ID No. 3143, Seq. ID No. 3147,  
20 Seq. ID No. 3149, Seq. ID No. 3151, Seq. ID No. 3153, Seq. ID No. 3159, Seq.  
ID No. 3161, Seq. ID No. 3167, Seq. ID No. 3169, Seq. ID No. 3171, Seq. ID No.  
3175, Seq. ID No. 3177, Seq. ID No. 3179, Seq. ID No. 3181, Seq. ID No. 3185,  
Seq. ID No. 3187, Seq. ID No. 3189, Seq. ID No. 3191, Seq. ID No. 3195, Seq.  
ID No. 3197, Seq. ID No. 3199, Seq. ID No. 3203, Seq. ID No. 3205, Seq. ID No.  
25 3207, Seq. ID No. 3209, Seq. ID No. 3211, Seq. ID No. 3221, Seq. ID No. 3223,  
Seq. ID No. 3225, Seq. ID No. 3227, Seq. ID No. 3229, Seq. ID No. 3231, Seq.  
ID No. 3233, Seq. ID No. 3235, Seq. ID No. 3237, Seq. ID No. 3239, Seq. ID No.  
3247, Seq. ID No. 3251, Seq. ID No. 3253, Seq. ID No. 3259, Seq. ID No. 3265,  
Seq. ID No. 3267, Seq. ID No. 3271, Seq. ID No. 3273, Seq. ID No. 3279, Seq.  
30 ID No. 3281, Seq. ID No. 3283, Seq. ID No. 3285, Seq. ID No. 3287, Seq. ID No.  
3289, Seq. ID No. 3291, Seq. ID No. 3293, Seq. ID No. 3295, Seq. ID No. 3299,  
Seq. ID No. 3301, Seq. ID No. 3303, Seq. ID No. 3305, Seq. ID No. 3307, Seq.  
ID No. 3309, Seq. ID No. 3311, Seq. ID No. 3313, Seq. ID No. 3315, Seq. ID No.

3319, Seq. ID No. 3321, Seq. ID No. 3327, Seq. ID No. 3329, Seq. ID No. 3333,  
Seq. ID No. 3341, Seq. ID No. 3343, Seq. ID No. 3345, Seq. ID No. 3347, Seq.  
ID No. 3361, Seq. ID No. 3363, Seq. ID No. 3365, Seq. ID No. 3367, Seq. ID No.  
3369, Seq. ID No. 3371, Seq. ID No. 3373, Seq. ID No. 3379, Seq. ID No. 3381,  
5 Seq. ID No. 3383, Seq. ID No. 3385, Seq. ID No. 3387, Seq. ID No. 3393, Seq.  
ID No. 3397, Seq. ID No. 3399, Seq. ID No. 3401, Seq. ID No. 3403, Seq. ID No.  
3407, Seq. ID No. 3409, Seq. ID No. 3411, Seq. ID No. 3413, Seq. ID No. 3417,  
Seq. ID No. 3419, Seq. ID No. 3423, Seq. ID No. 3429, Seq. ID No. 3431, Seq.  
ID No. 3435, Seq. ID No. 3437, Seq. ID No. 3439, Seq. ID No. 3443, Seq. ID No.  
10 3445, Seq. ID No. 3447, Seq. ID No. 3459, Seq. ID No. 3461, Seq. ID No. 3465,  
Seq. ID No. 3467, Seq. ID No. 3469, Seq. ID No. 3471, Seq. ID No. 3473, Seq.  
ID No. 3475, Seq. ID No. 3477, Seq. ID No. 3479, Seq. ID No. 3483, Seq. ID No.  
3485, Seq. ID No. 3487, Seq. ID No. 3489, Seq. ID No. 3495, Seq. ID No. 3497,  
Seq. ID No. 3499, Seq. ID No. 3501, Seq. ID No. 3507, Seq. ID No. 3509, Seq.  
15 ID No. 3511, Seq. ID No. 3513, Seq. ID No. 3515, Seq. ID No. 3521, Seq. ID No.  
3523, Seq. ID No. 3525, Seq. ID No. 3529, Seq. ID No. 3533, Seq. ID No. 3535,  
Seq. ID No. 3537, Seq. ID No. 3541, Seq. ID No. 3543, Seq. ID No. 3545, Seq.  
ID No. 3547, Seq. ID No. 3549, Seq. ID No. 3551, Seq. ID No. 3553, Seq. ID No.  
3555, Seq. ID No. 3557, Seq. ID No. 3559, Seq. ID No. 3563, Seq. ID No. 3565,  
20 Seq. ID No. 3567, Seq. ID No. 3569, Seq. ID No. 3571, Seq. ID No. 3575, Seq.  
ID No. 3577, Seq. ID No. 3579, Seq. ID No. 3583, Seq. ID No. 3585, Seq. ID No.  
3589, Seq. ID No. 3591, Seq. ID No. 3597, Seq. ID No. 3599, Seq. ID No. 3601,  
Seq. ID No. 3603, Seq. ID No. 3605, Seq. ID No. 3607, Seq. ID No. 3609, Seq.  
ID No. 3613, Seq. ID No. 3615, Seq. ID No. 3623, Seq. ID No. 3627, Seq. ID No.  
25 3631, Seq. ID No. 3633, Seq. ID No. 3637, Seq. ID No. 3639, Seq. ID No. 3641,  
Seq. ID No. 3643, Seq. ID No. 3645, Seq. ID No. 3647, Seq. ID No. 3649, Seq.  
ID No. 3651, Seq. ID No. 3653, Seq. ID No. 3655, Seq. ID No. 3657, Seq. ID No.  
3659, Seq. ID No. 3661, Seq. ID No. 3663, Seq. ID No. 3665, Seq. ID No. 3667,  
Seq. ID No. 3669, Seq. ID No. 3671, Seq. ID No. 3673, Seq. ID No. 3675, Seq.  
30 ID No. 3681, Seq. ID No. 3683, Seq. ID No. 3685, Seq. ID No. 3687, Seq. ID No.  
3691, Seq. ID No. 3693, Seq. ID No. 3695, Seq. ID No. 3697, Seq. ID No. 3699,  
Seq. ID No. 3701, Seq. ID No. 3703, Seq. ID No. 3705, Seq. ID No. 3707, Seq.  
ID No. 3709, Seq. ID No. 3711, Seq. ID No. 3713, Seq. ID No. 3715, Seq. ID No.

3719, Seq. ID No. 3721, Seq. ID No. 3725, Seq. ID No. 3729, Seq. ID No. 3731,  
Seq. ID No. 3733, Seq. ID No. 3735, Seq. ID No. 3737, Seq. ID No. 3739, Seq.  
ID No. 3743, Seq. ID No. 3747, Seq. ID No. 3749, Seq. ID No. 3751, Seq. ID No.  
3759, Seq. ID No. 3767, Seq. ID No. 3769, Seq. ID No. 3771, Seq. ID No. 3773,  
5 Seq. ID No. 3775, Seq. ID No. 3777, Seq. ID No. 3779, Seq. ID No. 3785, Seq.  
ID No. 3787, Seq. ID No. 3789, Seq. ID No. 3791, Seq. ID No. 3795, Seq. ID No.  
3797, Seq. ID No. 3801, Seq. ID No. 3803, Seq. ID No. 3805, Seq. ID No. 3809,  
Seq. ID No. 3811, Seq. ID No. 3819, Seq. ID No. 3821, Seq. ID No. 3823, Seq.  
ID No. 3825, Seq. ID No. 3827, Seq. ID No. 3829, Seq. ID No. 3831, Seq. ID No.  
10 3833, Seq. ID No. 3835, Seq. ID No. 3841, Seq. ID No. 3843, Seq. ID No. 3845,  
Seq. ID No. 3847, Seq. ID No. 3855, Seq. ID No. 3857, Seq. ID No. 3867, Seq.  
ID No. 3869, Seq. ID No. 3871, Seq. ID No. 3873, Seq. ID No. 3875, Seq. ID No.  
3877, Seq. ID No. 3881, Seq. ID No. 3883, Seq. ID No. 3885, Seq. ID No. 3887,  
Seq. ID No. 3893, Seq. ID No. 3897, Seq. ID No. 3899, Seq. ID No. 3901, Seq.  
15 ID No. 3905, Seq. ID No. 3907, Seq. ID No. 3909, Seq. ID No. 3911, Seq. ID No.  
3913, Seq. ID No. 3917, Seq. ID No. 3919, Seq. ID No. 3921, Seq. ID No. 3927,  
Seq. ID No. 3929, Seq. ID No. 3931, Seq. ID No. 3933, Seq. ID No. 3935, Seq.  
ID No. 3937, Seq. ID No. 3939, Seq. ID No. 3941, Seq. ID No. 3943, Seq. ID No.  
3945, Seq. ID No. 3947, Seq. ID No. 3949, Seq. ID No. 3951, Seq. ID No. 3953,  
20 Seq. ID No. 3955, Seq. ID No. 3957, Seq. ID No. 3961, Seq. ID No. 3965, Seq.  
ID No. 3967, Seq. ID No. 3969, Seq. ID No. 3971, Seq. ID No. 3977, Seq. ID No.  
3979, Seq. ID No. 3981, Seq. ID No. 3983, Seq. ID No. 3985, Seq. ID No. 3987,  
Seq. ID No. 3989, Seq. ID No. 3991, Seq. ID No. 3999, Seq. ID No. 4001, Seq.  
ID No. 4003, Seq. ID No. 4011, Seq. ID No. 4013, Seq. ID No. 4015, Seq. ID No.  
25 4017, Seq. ID No. 4019, Seq. ID No. 4021, Seq. ID No. 4023, Seq. ID No. 4029,  
Seq. ID No. 4031, Seq. ID No. 4033, Seq. ID No. 4035, Seq. ID No. 4037, Seq.  
ID No. 4051, Seq. ID No. 4053, Seq. ID No. 4055, Seq. ID No. 4057, Seq. ID No.  
4059, Seq. ID No. 4063, Seq. ID No. 4065, Seq. ID No. 4067, Seq. ID No. 4069,  
Seq. ID No. 4075, Seq. ID No. 4077, Seq. ID No. 4085, Seq. ID No. 4087, Seq.  
30 ID No. 4089, Seq. ID No. 4091, Seq. ID No. 4093, Seq. ID No. 4095, Seq. ID No.  
4097, Seq. ID No. 4099, Seq. ID No. 4105, Seq. ID No. 4107, Seq. ID No. 4109,  
Seq. ID No. 4113, Seq. ID No. 4115, Seq. ID No. 4117, Seq. ID No. 4119, Seq.  
ID No. 4121, Seq. ID No. 4123, Seq. ID No. 4125, Seq. ID No. 4127, Seq. ID No.

4129, Seq. ID No. 4131, Seq. ID No. 4147, Seq. ID No. 4149, Seq. ID No. 4155,  
Seq. ID No. 4157, Seq. ID No. 4159, Seq. ID No. 4161, Seq. ID No. 4163, Seq.  
ID No. 4165, Seq. ID No. 4167, Seq. ID No. 4169, Seq. ID No. 4171, Seq. ID No.  
4173, Seq. ID No. 4175, Seq. ID No. 4177, Seq. ID No. 4179, Seq. ID No. 4183,  
5 Seq. ID No. 4185, Seq. ID No. 4187, Seq. ID No. 4189, Seq. ID No. 4191, Seq.  
ID No. 4193, Seq. ID No. 4195, Seq. ID No. 4197, Seq. ID No. 4199, Seq. ID No.  
4201, Seq. ID No. 4203, Seq. ID No. 4205, Seq. ID No. 4207, Seq. ID No. 4209,  
Seq. ID No. 4211, Seq. ID No. 4213, Seq. ID No. 4215, Seq. ID No. 4217, Seq.  
ID No. 4219, Seq. ID No. 4229, Seq. ID No. 4235, Seq. ID No. 4237, Seq. ID No.  
10 4239, Seq. ID No. 4243, Seq. ID No. 4245, Seq. ID No. 4249, Seq. ID No. 4251,  
Seq. ID No. 4255, Seq. ID No. 4267, Seq. ID No. 4271, Seq. ID No. 4273, Seq.  
ID No. 4277, Seq. ID No. 4279, Seq. ID No. 4281, Seq. ID No. 4283, Seq. ID No.  
4289, Seq. ID No. 4291, Seq. ID No. 4293, Seq. ID No. 4295, Seq. ID No. 4299,  
Seq. ID No. 4301, Seq. ID No. 4303, Seq. ID No. 4305, Seq. ID No. 4309, Seq.  
15 ID No. 4315, Seq. ID No. 4317, Seq. ID No. 4319, Seq. ID No. 4321, Seq. ID No.  
4323, Seq. ID No. 4325, Seq. ID No. 4327, Seq. ID No. 4329, Seq. ID No. 4331,  
Seq. ID No. 4333, Seq. ID No. 4335, Seq. ID No. 4337, Seq. ID No. 4339, Seq.  
ID No. 4341, Seq. ID No. 4345, Seq. ID No. 4347, Seq. ID No. 4349, Seq. ID No.  
4351, Seq. ID No. 4353, Seq. ID No. 4355, Seq. ID No. 4357, Seq. ID No. 4359,  
20 Seq. ID No. 4361, Seq. ID No. 4363, Seq. ID No. 4365, Seq. ID No. 4367, Seq.  
ID No. 4369, Seq. ID No. 4371, Seq. ID No. 4373, Seq. ID No. 4375, Seq. ID No.  
4377, Seq. ID No. 4381, Seq. ID No. 4383, Seq. ID No. 4387, Seq. ID No. 4393,  
Seq. ID No. 4395, Seq. ID No. 4397, Seq. ID No. 4401, Seq. ID No. 4405, Seq.  
ID No. 4407, Seq. ID No. 4409, Seq. ID No. 4411, Seq. ID No. 4413, Seq. ID No.  
25 4415, Seq. ID No. 4417, Seq. ID No. 4419, Seq. ID No. 4421, Seq. ID No. 4423,  
Seq. ID No. 4425, Seq. ID No. 4427, Seq. ID No. 4429, Seq. ID No. 4431, Seq.  
ID No. 4433, Seq. ID No. 4435, Seq. ID No. 4443, Seq. ID No. 4445, Seq. ID No.  
4447, Seq. ID No. 4449, Seq. ID No. 4451, Seq. ID No. 4453, Seq. ID No. 4455,  
Seq. ID No. 4457, Seq. ID No. 4459, Seq. ID No. 4461, Seq. ID No. 4463, Seq.  
30 ID No. 4465, Seq. ID No. 4467, Seq. ID No. 4471, Seq. ID No. 4475, Seq. ID No.  
4477, Seq. ID No. 4479, Seq. ID No. 4487, Seq. ID No. 4489, Seq. ID No. 4491,  
Seq. ID No. 4499, Seq. ID No. 4501, Seq. ID No. 4503, Seq. ID No. 4505, Seq.  
ID No. 4507, Seq. ID No. 4509, Seq. ID No. 4511, Seq. ID No. 4517, Seq. ID No.

4519, Seq. ID No. 4521, Seq. ID No. 4523, Seq. ID No. 4525, Seq. ID No. 4531,  
Seq. ID No. 4535, Seq. ID No. 4537, Seq. ID No. 4539, Seq. ID No. 4541, Seq.  
ID No. 4543, Seq. ID No. 4545, Seq. ID No. 4547, Seq. ID No. 4549, Seq. ID No.  
4551, Seq. ID No. 4553, Seq. ID No. 4555, Seq. ID No. 4557, Seq. ID No. 4559,  
5 Seq. ID No. 4561, Seq. ID No. 4563, Seq. ID No. 4565, Seq. ID No. 4567, Seq.  
ID No. 4569, Seq. ID No. 4571, Seq. ID No. 4573, Seq. ID No. 4575, Seq. ID No.  
4577, Seq. ID No. 4579, Seq. ID No. 4581, Seq. ID No. 4583, Seq. ID No. 4585,  
Seq. ID No. 4591, Seq. ID No. 4593, Seq. ID No. 4595, Seq. ID No. 4597, Seq.  
ID No. 4599, Seq. ID No. 4601, Seq. ID No. 4603, Seq. ID No. 4605, Seq. ID No.  
10 4607, Seq. ID No. 4609, Seq. ID No. 4611, Seq. ID No. 4613, Seq. ID No. 4615,  
Seq. ID No. 4617, Seq. ID No. 4619, Seq. ID No. 4621, Seq. ID No. 4623, Seq.  
ID No. 4625, Seq. ID No. 4627, Seq. ID No. 4629, Seq. ID No. 4631, Seq. ID No.  
4633, Seq. ID No. 4635, Seq. ID No. 4637, Seq. ID No. 4645, Seq. ID No. 4647,  
Seq. ID No. 4649, Seq. ID No. 4651, Seq. ID No. 4653, Seq. ID No. 4655, Seq.  
15 ID No. 4657, Seq. ID No. 4661, Seq. ID No. 4663, Seq. ID No. 4665, Seq. ID No.  
4667, Seq. ID No. 4669, Seq. ID No. 4671, Seq. ID No. 4673, Seq. ID No. 4675,  
Seq. ID No. 4677, Seq. ID No. 4679, Seq. ID No. 4683, Seq. ID No. 4685, Seq.  
ID No. 4689, Seq. ID No. 4691, Seq. ID No. 4693, Seq. ID No. 4697, Seq. ID No.  
4699, Seq. ID No. 4701, Seq. ID No. 4703, Seq. ID No. 4713, Seq. ID No. 4719,  
20 Seq. ID No. 4721, Seq. ID No. 4723, Seq. ID No. 4725, Seq. ID No. 4727, Seq.  
ID No. 4729, Seq. ID No. 4731, Seq. ID No. 4733, Seq. ID No. 4735, Seq. ID No.  
4739, Seq. ID No. 4741, Seq. ID No. 4743, Seq. ID No. 4745, Seq. ID No. 4747,  
Seq. ID No. 4749, Seq. ID No. 4751, Seq. ID No. 4753, Seq. ID No. 4755, Seq.  
ID No. 4757, Seq. ID No. 4761, Seq. ID No. 4763, Seq. ID No. 4765, Seq. ID No.  
25 4767, Seq. ID No. 4769, Seq. ID No. 4771, Seq. ID No. 4773, Seq. ID No. 4775,  
Seq. ID No. 4777, Seq. ID No. 4779, Seq. ID No. 4781, Seq. ID No. 4783, Seq.  
ID No. 4785, Seq. ID No. 4787, Seq. ID No. 4789, Seq. ID No. 4791, Seq. ID No.  
4793, Seq. ID No. 4795, Seq. ID No. 4797, Seq. ID No. 4799, Seq. ID No. 4801,  
Seq. ID No. 4803, Seq. ID No. 4805, Seq. ID No. 4807, Seq. ID No. 4809, Seq.  
30 ID No. 4811, Seq. ID No. 4815, Seq. ID No. 4817, Seq. ID No. 4819, Seq. ID No.  
4821, Seq. ID No. 4823, Seq. ID No. 4825, Seq. ID No. 4829, Seq. ID No. 4831,  
Seq. ID No. 4833, Seq. ID No. 4835, Seq. ID No. 4837, Seq. ID No. 4839, Seq.  
ID No. 4841, Seq. ID No. 4843, Seq. ID No. 4845, Seq. ID No. 4847, Seq. ID No.

4849, Seq. ID No. 4851, Seq. ID No. 4855, Seq. ID No. 4857, Seq. ID No. 4859,  
Seq. ID No. 4861, Seq. ID No. 4865, Seq. ID No. 4867, Seq. ID No. 4877, Seq.  
ID No. 4879, Seq. ID No. 4881, Seq. ID No. 4883, Seq. ID No. 4885, Seq. ID No.  
4887, Seq. ID No. 4889, Seq. ID No. 4891, Seq. ID No. 4893, Seq. ID No. 4895,  
5 Seq. ID No. 4897, Seq. ID No. 4899, Seq. ID No. 4901, Seq. ID No. 4903, Seq.  
ID No. 4905, Seq. ID No. 4907, Seq. ID No. 4909, Seq. ID No. 4911, Seq. ID No.  
4913, Seq. ID No. 4915, Seq. ID No. 4917, Seq. ID No. 4925, Seq. ID No. 4927,  
Seq. ID No. 4933, Seq. ID No. 4935, Seq. ID No. 4937, Seq. ID No. 4939, Seq.  
ID No. 4941, Seq. ID No. 4943, Seq. ID No. 4945, Seq. ID No. 4947, Seq. ID No.  
10 4953, Seq. ID No. 4955, Seq. ID No. 4957, Seq. ID No. 4959, Seq. ID No. 4961,  
Seq. ID No. 4963, Seq. ID No. 4965, Seq. ID No. 4967, Seq. ID No. 4969, Seq.  
ID No. 4971, Seq. ID No. 4973, Seq. ID No. 4977, Seq. ID No. 4979, Seq. ID No.  
4981, Seq. ID No. 4983, Seq. ID No. 4985, Seq. ID No. 4989, Seq. ID No. 4991,  
Seq. ID No. 4993, Seq. ID No. 4995, Seq. ID No. 4997, Seq. ID No. 5001, Seq.  
15 ID No. 5003, Seq. ID No. 5005, Seq. ID No. 5007, Seq. ID No. 5009, Seq. ID No.  
5011, Seq. ID No. 5015, Seq. ID No. 5017, Seq. ID No. 5019, Seq. ID No. 5021,  
Seq. ID No. 5023, Seq. ID No. 5025, Seq. ID No. 5027, Seq. ID No. 5029, Seq.  
ID No. 5033, Seq. ID No. 5035, Seq. ID No. 5037, Seq. ID No. 5039, Seq. ID No.  
5041, Seq. ID No. 5043, Seq. ID No. 5045, Seq. ID No. 5047, Seq. ID No. 5049,  
20 Seq. ID No. 5051, Seq. ID No. 5053, Seq. ID No. 5055, Seq. ID No. 5057, Seq.  
ID No. 5059, Seq. ID No. 5065, Seq. ID No. 5067, Seq. ID No. 5071, Seq. ID No.  
5073, Seq. ID No. 5075, Seq. ID No. 5077, Seq. ID No. 5079, Seq. ID No. 5081,  
Seq. ID No. 5083, Seq. ID No. 5087, Seq. ID No. 5089, Seq. ID No. 5091, Seq.  
ID No. 5093, Seq. ID No. 5095, Seq. ID No. 5097, Seq. ID No. 5099, Seq. ID No.  
25 5101, Seq. ID No. 5105, Seq. ID No. 5107, Seq. ID No. 5109, Seq. ID No. 5111,  
Seq. ID No. 5113, Seq. ID No. 5117, Seq. ID No. 5119, Seq. ID No. 5121, Seq.  
ID No. 5127, Seq. ID No. 5143, Seq. ID No. 5145, Seq. ID No. 5147, Seq. ID No.  
5149, Seq. ID No. 5151, Seq. ID No. 5153, Seq. ID No. 5155, Seq. ID No. 5157,  
Seq. ID No. 5161, Seq. ID No. 5163, Seq. ID No. 5167, Seq. ID No. 5169, Seq.  
30 ID No. 5171, Seq. ID No. 5173, Seq. ID No. 5177, Seq. ID No. 5179, Seq. ID No.  
5181, Seq. ID No. 5183, Seq. ID No. 5185, Seq. ID No. 5187, Seq. ID No. 5189,  
Seq. ID No. 5191, Seq. ID No. 5193, Seq. ID No. 5195, Seq. ID No. 5201, Seq.  
ID No. 5203, Seq. ID No. 5209, Seq. ID No. 5211, Seq. ID No. 5215, Seq. ID No.



5217, Seq. ID No. 5221, Seq. ID No. 5225, Seq. ID No. 5227, Seq. ID No. 5229,  
Seq. ID No. 5231, Seq. ID No. 5233, Seq. ID No. 5235, Seq. ID No. 5237, Seq.  
ID No. 5239, Seq. ID No. 5241, Seq. ID No. 5243, Seq. ID No. 5245, Seq. ID No.  
5247, Seq. ID No. 5249, Seq. ID No. 5251, Seq. ID No. 5253, Seq. ID No. 5255,  
5 Seq. ID No. 5257, Seq. ID No. 5259, Seq. ID No. 5261, Seq. ID No. 5263, Seq.  
ID No. 5265, Seq. ID No. 5269, Seq. ID No. 5271, Seq. ID No. 5283, Seq. ID No.  
5287, Seq. ID No. 5289, Seq. ID No. 5291, Seq. ID No. 5293, Seq. ID No. 5295,  
Seq. ID No. 5297, Seq. ID No. 5299, Seq. ID No. 5301, Seq. ID No. 5303, Seq.  
ID No. 5305, Seq. ID No. 5307, Seq. ID No. 5309, Seq. ID No. 5311, Seq. ID No.  
10 5313, Seq. ID No. 5315, Seq. ID No. 5317, Seq. ID No. 5319, Seq. ID No. 5321,  
Seq. ID No. 5323, Seq. ID No. 5325, Seq. ID No. 5333, Seq. ID No. 5335, Seq.  
ID No. 5337, Seq. ID No. 5339, Seq. ID No. 5343, Seq. ID No. 5345, Seq. ID No.  
5347, Seq. ID No. 5349, Seq. ID No. 5351, Seq. ID No. 5353, Seq. ID No. 5355,  
Seq. ID No. 5357, Seq. ID No. 5359, Seq. ID No. 5361, Seq. ID No. 5363, Seq.  
15 ID No. 5365, Seq. ID No. 5367, Seq. ID No. 5369, Seq. ID No. 5371, Seq. ID No.  
5373, Seq. ID No. 5375, Seq. ID No. 5381, Seq. ID No. 5383, Seq. ID No. 5389,  
Seq. ID No. 5391, Seq. ID No. 5393, Seq. ID No. 5395, Seq. ID No. 5397, Seq.  
ID No. 5399, Seq. ID No. 5401, Seq. ID No. 5403, Seq. ID No. 5407, Seq. ID No.  
5409, Seq. ID No. 5411, Seq. ID No. 5417, Seq. ID No. 5419, Seq. ID No. 5421,  
20 Seq. ID No. 5423, Seq. ID No. 5425, Seq. ID No. 5427, Seq. ID No. 5429, Seq.  
ID No. 5431, Seq. ID No. 5435, Seq. ID No. 5437, Seq. ID No. 5439, Seq. ID No.  
5441, Seq. ID No. 5443, Seq. ID No. 5445, Seq. ID No. 5447, Seq. ID No. 5449,  
Seq. ID No. 5451, Seq. ID No. 5455, Seq. ID No. 5457, Seq. ID No. 5467, Seq.  
ID No. 5469, Seq. ID No. 5471, Seq. ID No. 5473, Seq. ID No. 5475, Seq. ID No.  
25 5477, Seq. ID No. 5479, Seq. ID No. 5481, Seq. ID No. 5483, Seq. ID No. 5485,  
Seq. ID No. 5487, Seq. ID No. 5489, Seq. ID No. 5493, Seq. ID No. 5495, Seq.  
ID No. 5499, Seq. ID No. 5501, Seq. ID No. 5503, Seq. ID No. 5505, Seq. ID No.  
5507, Seq. ID No. 5511, Seq. ID No. 5519, Seq. ID No. 5521, Seq. ID No. 5523,  
Seq. ID No. 5527, Seq. ID No. 5535, Seq. ID No. 5537, Seq. ID No. 5539, Seq.  
30 ID No. 5541, Seq. ID No. 5547, Seq. ID No. 5549, Seq. ID No. 5551, Seq. ID No.  
5553, Seq. ID No. 5555, Seq. ID No. 5557, Seq. ID No. 5559, Seq. ID No. 5561,  
Seq. ID No. 5563, Seq. ID No. 5565, Seq. ID No. 5567, Seq. ID No. 5571, Seq.  
ID No. 5573, Seq. ID No. 5575, Seq. ID No. 5577, Seq. ID No. 5579, Seq. ID No.

5581, Seq. ID No. 5583, Seq. ID No. 5585, Seq. ID No. 5599, Seq. ID No. 5601,  
Seq. ID No. 5603, Seq. ID No. 5605, Seq. ID No. 5607, Seq. ID No. 5613, Seq.  
ID No. 5615, Seq. ID No. 5617, Seq. ID No. 5619, Seq. ID No. 5627, Seq. ID No.  
5629, Seq. ID No. 5631, Seq. ID No. 5635, Seq. ID No. 5645, Seq. ID No. 5647,  
5 Seq. ID No. 5651, Seq. ID No. 5653, Seq. ID No. 5655, Seq. ID No. 5657, Seq.  
ID No. 5661, Seq. ID No. 5663, Seq. ID No. 5665, Seq. ID No. 5669, Seq. ID No.  
5671, Seq. ID No. 5673, Seq. ID No. 5675, Seq. ID No. 5677, Seq. ID No. 5679,  
Seq. ID No. 5691, Seq. ID No. 5693, Seq. ID No. 5695, Seq. ID No. 5697, Seq.  
ID No. 5701, Seq. ID No. 5707, Seq. ID No. 5713, Seq. ID No. 5715, Seq. ID No.  
10 5717, Seq. ID No. 5721, Seq. ID No. 5723, Seq. ID No. 5725, Seq. ID No. 5727,  
Seq. ID No. 5731, Seq. ID No. 5737, Seq. ID No. 5741, Seq. ID No. 5743, Seq.  
ID No. 5745, Seq. ID No. 5747, Seq. ID No. 5749, Seq. ID No. 5751, Seq. ID No.  
5753, Seq. ID No. 5755, Seq. ID No. 5757, Seq. ID No. 5759, Seq. ID No. 5761,  
Seq. ID No. 5769, Seq. ID No. 5773, Seq. ID No. 5775, Seq. ID No. 5777, Seq.  
15 ID No. 5779, Seq. ID No. 5781, Seq. ID No. 5787, Seq. ID No. 5789, Seq. ID No.  
5793, Seq. ID No. 5795, Seq. ID No. 5799, Seq. ID No. 5801, Seq. ID No. 5803,  
Seq. ID No. 5805, Seq. ID No. 5807, Seq. ID No. 5809, Seq. ID No. 5811, Seq.  
ID No. 5813, Seq. ID No. 5815, Seq. ID No. 5817, Seq. ID No. 5819, Seq. ID No.  
5821, Seq. ID No. 5823, Seq. ID No. 5825, Seq. ID No. 5827, Seq. ID No. 5831,  
20 Seq. ID No. 5833, Seq. ID No. 5835, Seq. ID No. 5837, Seq. ID No. 5839, Seq.  
ID No. 5841, Seq. ID No. 5843, Seq. ID No. 5845, Seq. ID No. 5847, Seq. ID No.  
5849, Seq. ID No. 5851, Seq. ID No. 5853, Seq. ID No. 5855, Seq. ID No. 5857,  
Seq. ID No. 5859, Seq. ID No. 5861, Seq. ID No. 5863, Seq. ID No. 5865, Seq.  
ID No. 5867, Seq. ID No. 5869, Seq. ID No. 5871, Seq. ID No. 5873, Seq. ID No.  
25 5875, Seq. ID No. 5877, Seq. ID No. 5881, Seq. ID No. 5887, Seq. ID No. 5891,  
Seq. ID No. 5897, Seq. ID No. 5903, Seq. ID No. 5907, Seq. ID No. 5911, Seq.  
ID No. 5913, Seq. ID No. 5915, Seq. ID No. 5917, Seq. ID No. 5919, Seq. ID No.  
5925, Seq. ID No. 5931, Seq. ID No. 5933, Seq. ID No. 5935, Seq. ID No. 5937,  
Seq. ID No. 5941, Seq. ID No. 5943, Seq. ID No. 5945, Seq. ID No. 5947, Seq.  
30 ID No. 5949, Seq. ID No. 5951, Seq. ID No. 5953, Seq. ID No. 5955, Seq. ID No.  
5957, Seq. ID No. 5959, Seq. ID No. 5961, Seq. ID No. 5963, Seq. ID No. 5965,  
Seq. ID No. 5967, Seq. ID No. 5969, Seq. ID No. 5971, Seq. ID No. 5973, Seq.  
ID No. 5975, Seq. ID No. 5977, Seq. ID No. 5979, Seq. ID No. 5981, Seq. ID No.

5983, Seq. ID No. 5985, Seq. ID No. 5987, Seq. ID No. 5989, Seq. ID No. 5991,  
Seq. ID No. 5993, Seq. ID No. 5995, Seq. ID No. 5997, Seq. ID No. 5999, Seq.  
ID No. 6001, Seq. ID No. 6003, Seq. ID No. 6005, Seq. ID No. 6007, Seq. ID No.  
6009, Seq. ID No. 6011, Seq. ID No. 6013, Seq. ID No. 6015, Seq. ID No. 6017,  
5 Seq. ID No. 6019, Seq. ID No. 6021, Seq. ID No. 6029, Seq. ID No. 6031, Seq.  
ID No. 6033, Seq. ID No. 6035, Seq. ID No. 6037, Seq. ID No. 6039, Seq. ID No.  
6041, Seq. ID No. 6045, Seq. ID No. 6049, Seq. ID No. 6051, Seq. ID No. 6055,  
Seq. ID No. 6057, Seq. ID No. 6061, Seq. ID No. 6065, Seq. ID No. 6069, Seq.  
ID No. 6071, Seq. ID No. 6073, Seq. ID No. 6075, Seq. ID No. 6077, Seq. ID No.  
10 6079, Seq. ID No. 6081, Seq. ID No. 6083, Seq. ID No. 6085, Seq. ID No. 6093,  
Seq. ID No. 6097, Seq. ID No. 6099, Seq. ID No. 6101, Seq. ID No. 6105, Seq.  
ID No. 6113, Seq. ID No. 6119, Seq. ID No. 6121, Seq. ID No. 6123, Seq. ID No.  
6125, Seq. ID No. 6127, Seq. ID No. 6129, Seq. ID No. 6131, Seq. ID No. 6133,  
Seq. ID No. 6139, Seq. ID No. 6141, Seq. ID No. 6143, Seq. ID No. 6145, Seq.  
15 ID No. 6147, Seq. ID No. 6149, Seq. ID No. 6151, Seq. ID No. 6153, Seq. ID No.  
6155, Seq. ID No. 6157, Seq. ID No. 6167, Seq. ID No. 6171, Seq. ID No. 6173,  
Seq. ID No. 6175, Seq. ID No. 6177, Seq. ID No. 6179, Seq. ID No. 6181, Seq.  
ID No. 6193, Seq. ID No. 6195, Seq. ID No. 6199, Seq. ID No. 6201, Seq. ID No.  
6207, Seq. ID No. 6211, Seq. ID No. 6213, Seq. ID No. 6215, Seq. ID No. 6219,  
20 Seq. ID No. 6231, Seq. ID No. 6233, Seq. ID No. 6239, Seq. ID No. 6247, Seq.  
ID No. 6251, Seq. ID No. 6255, Seq. ID No. 6257, Seq. ID No. 6261, Seq. ID No.  
6269, Seq. ID No. 6271, Seq. ID No. 6277, Seq. ID No. 6279, Seq. ID No. 6281,  
Seq. ID No. 6287, Seq. ID No. 6291, Seq. ID No. 6293, Seq. ID No. 6295, Seq.  
ID No. 6297, Seq. ID No. 6299, Seq. ID No. 6305, Seq. ID No. 6307, Seq. ID No.  
25 6309, Seq. ID No. 6311, Seq. ID No. 6313, Seq. ID No. 6315, Seq. ID No. 6317,  
Seq. ID No. 6319, Seq. ID No. 6321, Seq. ID No. 6323, Seq. ID No. 6329, Seq.  
ID No. 6331, Seq. ID No. 6333, Seq. ID No. 6335, Seq. ID No. 6337, Seq. ID No.  
6339, Seq. ID No. 6341, Seq. ID No. 6343, Seq. ID No. 6345, Seq. ID No. 6347,  
Seq. ID No. 6349, Seq. ID No. 6351, Seq. ID No. 6353, Seq. ID No. 6355, Seq.  
30 ID No. 6357, Seq. ID No. 6359, Seq. ID No. 6361, Seq. ID No. 6367, Seq. ID No.  
6369, Seq. ID No. 6371, Seq. ID No. 6373, Seq. ID No. 6375, Seq. ID No. 6379,  
Seq. ID No. 6385, Seq. ID No. 6387, Seq. ID No. 6389, Seq. ID No. 6391, Seq.  
ID No. 6393, Seq. ID No. 6395, Seq. ID No. 6397, Seq. ID No. 6399, Seq. ID No.

6401, Seq. ID No. 6403, Seq. ID No. 6405, Seq. ID No. 6407, Seq. ID No. 6409, Seq. ID No. 6411, Seq. ID No. 6413, Seq. ID No. 6417, Seq. ID No. 6419, Seq. ID No. 6421, Seq. ID No. 6423, Seq. ID No. 6433, Seq. ID No. 6435, Seq. ID No. 6437, Seq. ID No. 6439, Seq. ID No. 6441, Seq. ID No. 6443, Seq. ID No. 6445, Seq. ID No. 6447, Seq. ID No. 6449, Seq. ID No. 6451, Seq. ID No. 6453, Seq. ID No. 6455, Seq. ID No. 6457, Seq. ID No. 6459, Seq. ID No. 6461, Seq. ID No. 6463, Seq. ID No. 6465, Seq. ID No. 6467, Seq. ID No. 6469, Seq. ID No. 6471, Seq. ID No. 6475, Seq. ID No. 6477, Seq. ID No. 6481, Seq. ID No. 6483, Seq. ID No. 6485, Seq. ID No. 6487, Seq. ID No. 6489, Seq. ID No. 6491, Seq. ID No. 6493, Seq. ID No. 6495, Seq. ID No. 6499, Seq. ID No. 6501, Seq. ID No. 6503, Seq. ID No. 6505, Seq. ID No. 6507, Seq. ID No. 6509, Seq. ID No. 6511, Seq. ID No. 6513, Seq. ID No. 6515, Seq. ID No. 6519, Seq. ID No. 6521, Seq. ID No. 6523, Seq. ID No. 6525, Seq. ID No. 6527, Seq. ID No. 6529, Seq. ID No. 6531, Seq. ID No. 6533, Seq. ID No. 6535, Seq. ID No. 6537, Seq. ID No. 6539, Seq. ID No. 6545, Seq. ID No. 6547, Seq. ID No. 6549, Seq. ID No. 6551, Seq. ID No. 6553, Seq. ID No. 6559, Seq. ID No. 6561, Seq. ID No. 6563, Seq. ID No. 6565, Seq. ID No. 6567, Seq. ID No. 6569, Seq. ID No. 6575, Seq. ID No. 6577, Seq. ID No. 6579, Seq. ID No. 6583, Seq. ID No. 6585, Seq. ID No. 6587, Seq. ID No. 6589, Seq. ID No. 6591, Seq. ID No. 6605, Seq. ID No. 6607, Seq. ID No. 6609, Seq. ID No. 6611, Seq. ID No. 6613, Seq. ID No. 6615, Seq. ID No. 6617, Seq. ID No. 6619, Seq. ID No. 6621, Seq. ID No. 6623, Seq. ID No. 6625, Seq. ID No. 6627, Seq. ID No. 6629, Seq. ID No. 6633, Seq. ID No. 6635, Seq. ID No. 6641, and Seq. ID No. 6647.

16. The polynucleotide of claim 7, wherein the polynucleotide encoding a polypeptide is identified by Pfam analysis, and the polynucleotide is selected from one of Seq. ID No. 89, Seq. ID No. 145, Seq. ID No. 155, Seq. ID No. 167, Seq. ID No. 173, Seq. ID No. 191, Seq. ID No. 215, Seq. ID No. 219, Seq. ID No. 221, Seq. ID No. 223, Seq. ID No. 225, Seq. ID No. 233, Seq. ID No. 239, Seq. ID No. 251, Seq. ID No. 253, Seq. ID No. 271, Seq. ID No. 291, Seq. ID No. 331, Seq. ID No. 341, Seq. ID No. 345, Seq. ID No. 375, Seq. ID No. 501, Seq. ID No. 505, Seq. ID No. 511, Seq. ID No. 529, Seq. ID No. 567, Seq. ID No. 569, Seq. ID No. 575, Seq. ID No. 593, Seq. ID No. 595, Seq. ID No. 601, Seq. ID No. 637, Seq. ID No. 649,

Seq. ID No. 661, Seq. ID No. 669, Seq. ID No. 675, Seq. ID No. 681, Seq. ID No. 683, Seq. ID No. 729, Seq. ID No. 753, Seq. ID No. 779, Seq. ID No. 827, Seq. ID No. 839, Seq. ID No. 895, Seq. ID No. 939, Seq. ID No. 969, Seq. ID No. 985, Seq. ID No. 1015, Seq. ID No. 1039, Seq. ID No. 1075, Seq. ID No. 1137, Seq. ID No. 1155, Seq. ID No. 1163, Seq. ID No. 1175, Seq. ID No. 1223, Seq. ID No. 1231, Seq. ID No. 1237, Seq. ID No. 1241, Seq. ID No. 1261, Seq. ID No. 1331, Seq. ID No. 1339, Seq. ID No. 1369, Seq. ID No. 1477, Seq. ID No. 1517, Seq. ID No. 1531, Seq. ID No. 1539, Seq. ID No. 1549, Seq. ID No. 1563, Seq. ID No. 1567, Seq. ID No. 1571, Seq. ID No. 1573, Seq. ID No. 1589, Seq. ID No. 1595, Seq. ID No. 1647, Seq. ID No. 1657, Seq. ID No. 1771, Seq. ID No. 1785, Seq. ID No. 1789, Seq. ID No. 1819, Seq. ID No. 1821, Seq. ID No. 1969, Seq. ID No. 2015, Seq. ID No. 2047, Seq. ID No. 2087, Seq. ID No. 2089, Seq. ID No. 2093, Seq. ID No. 2115, Seq. ID No. 2117, Seq. ID No. 2127, Seq. ID No. 2141, Seq. ID No. 2179, Seq. ID No. 2207, Seq. ID No. 2223, Seq. ID No. 2253, Seq. ID No. 2275, Seq. ID No. 2301, Seq. ID No. 2315, Seq. ID No. 2329, Seq. ID No. 2343, Seq. ID No. 2349, Seq. ID No. 2363, Seq. ID No. 2381, Seq. ID No. 2391, Seq. ID No. 2417, Seq. ID No. 2421, Seq. ID No. 2423, Seq. ID No. 2429, Seq. ID No. 2481, Seq. ID No. 2487, Seq. ID No. 2489, Seq. ID No. 2491, Seq. ID No. 2509, Seq. ID No. 2519, Seq. ID No. 2525, Seq. ID No. 2547, Seq. ID No. 2553, Seq. ID No. 2563, Seq. ID No. 2587, Seq. ID No. 2599, Seq. ID No. 2607, Seq. ID No. 2613, Seq. ID No. 2651, Seq. ID No. 2675, Seq. ID No. 2681, Seq. ID No. 2687, Seq. ID No. 2693, Seq. ID No. 2699, Seq. ID No. 2703, Seq. ID No. 2709, Seq. ID No. 2711, Seq. ID No. 2727, Seq. ID No. 2753, Seq. ID No. 2819, Seq. ID No. 2821, Seq. ID No. 2823, Seq. ID No. 2867, Seq. ID No. 2871, Seq. ID No. 2907, Seq. ID No. 2919, Seq. ID No. 2957, Seq. ID No. 2971, Seq. ID No. 2979, Seq. ID No. 2999, Seq. ID No. 3005, Seq. ID No. 3019, Seq. ID No. 3035, Seq. ID No. 3065, Seq. ID No. 3085, Seq. ID No. 3149, Seq. ID No. 3165, Seq. ID No. 3183, Seq. ID No. 3203, Seq. ID No. 3211, Seq. ID No. 3251, Seq. ID No. 3259, Seq. ID No. 3319, Seq. ID No. 3323, Seq. ID No. 3335, Seq. ID No. 3337, Seq. ID No. 3347, Seq. ID No. 3359, Seq. ID No. 3377, Seq. ID No. 3379, Seq. ID No. 3399, Seq. ID No. 3425, Seq. ID No. 3483, Seq. ID No. 3495, Seq. ID No. 3497, Seq. ID No. 3519, Seq. ID No. 3529, Seq. ID No. 3599, Seq. ID No. 3611, Seq. ID No. 3615, Seq. ID No. 3619, Seq. ID No. 3663, Seq. ID No. 3739, Seq. ID No. 3759,

Seq. ID No. 3771, Seq. ID No. 3797, Seq. ID No. 3825, Seq. ID No. 3841, Seq. ID No. 3855, Seq. ID No. 3863, Seq. ID No. 3901, Seq. ID No. 3929, Seq. ID No. 4015, Seq. ID No. 4017, Seq. ID No. 4055, Seq. ID No. 4075, Seq. ID No. 4085, Seq. ID No. 4089, Seq. ID No. 4099, Seq. ID No. 4105, Seq. ID No. 4129, Seq. ID No. 4203, Seq. ID No. 4243, Seq. ID No. 4251, Seq. ID No. 4343, Seq. ID No. 4383, Seq. ID No. 4475, Seq. ID No. 4481, Seq. ID No. 4487, Seq. ID No. 4491, Seq. ID No. 4533, Seq. ID No. 4627, Seq. ID No. 4705, Seq. ID No. 4713, Seq. ID No. 4717, Seq. ID No. 4719, Seq. ID No. 4729, Seq. ID No. 4789, Seq. ID No. 4791, Seq. ID No. 4793, Seq. ID No. 4803, Seq. ID No. 4813, Seq. ID No. 4815, Seq. ID No. 4825, Seq. ID No. 4833, Seq. ID No. 4837, Seq. ID No. 4875, Seq. ID No. 4879, Seq. ID No. 4919, Seq. ID No. 4931, Seq. ID No. 4947, Seq. ID No. 4985, Seq. ID No. 5077, Seq. ID No. 5115, Seq. ID No. 5117, Seq. ID No. 5127, Seq. ID No. 5141, Seq. ID No. 5193, Seq. ID No. 5215, Seq. ID No. 5219, Seq. ID No. 5275, Seq. ID No. 5381, Seq. ID No. 5389, Seq. ID No. 5409, Seq. ID No. 5411, Seq. ID No. 5475, Seq. ID No. 5491, Seq. ID No. 5513, Seq. ID No. 5519, Seq. ID No. 5525, Seq. ID No. 5529, Seq. ID No. 5537, Seq. ID No. 5557, Seq. ID No. 5581, Seq. ID No. 5599, Seq. ID No. 5637, Seq. ID No. 5685, Seq. ID No. 5723, Seq. ID No. 5755, Seq. ID No. 5761, Seq. ID No. 5895, Seq. ID No. 5901, Seq. ID No. 5903, Seq. ID No. 5911, Seq. ID No. 5913, Seq. ID No. 5919, Seq. ID No. 5923, Seq. ID No. 5929, Seq. ID No. 6001, Seq. ID No. 6043, Seq. ID No. 6053, Seq. ID No. 6055, Seq. ID No. 6089, Seq. ID No. 6095, Seq. ID No. 6111, Seq. ID No. 6117, Seq. ID No. 6165, Seq. ID No. 6169, Seq. ID No. 6187, Seq. ID No. 6195, Seq. ID No. 6219, Seq. ID No. 6233, Seq. ID No. 6269, Seq. ID No. 6275, Seq. ID No. 6279, Seq. ID No. 6287, Seq. ID No. 6297, Seq. ID No. 6299, Seq. ID No. 6305, Seq. ID No. 6311, Seq. ID No. 6369, Seq. ID No. 6379, Seq. ID No. 6587, and Seq. ID No. 6591

17. The polynucleotide of claim 7, wherein the polynucleotide encoding a polypeptide is identified by BlastP analysis, and the polynucleotide is selected from one of Seq. ID No. 9, Seq. ID No. 17, Seq. ID No. 45, Seq. ID No. 49, Seq. ID No. 53, Seq. ID No. 59, Seq. ID No. 89, Seq. ID No. 145, Seq. ID No. 157, Seq. ID No. 167, Seq. ID No. 171, Seq. ID No. 191, Seq. ID No. 215, Seq. ID No. 217, Seq. ID No. 225, Seq. ID No. 239, Seq. ID No. 253, Seq. ID No. 273, Seq. ID No. 277,

Seq. ID No. 289, Seq. ID No. 329, Seq. ID No. 343, Seq. ID No. 345, Seq. ID No. 375, Seq. ID No. 501, Seq. ID No. 505, Seq. ID No. 511, Seq. ID No. 515, Seq. ID No. 529, Seq. ID No. 569, Seq. ID No. 575, Seq. ID No. 593, Seq. ID No. 595, Seq. ID No. 637, Seq. ID No. 659, Seq. ID No. 669, Seq. ID No. 675, Seq. ID No. 681, Seq. ID No. 729, Seq. ID No. 779, Seq. ID No. 819, Seq. ID No. 895, Seq. ID No. 921, Seq. ID No. 935, Seq. ID No. 955, Seq. ID No. 967, Seq. ID No. 985, Seq. ID No. 1017, Seq. ID No. 1039, Seq. ID No. 1075, Seq. ID No. 1089, Seq. ID No. 1137, Seq. ID No. 1223, Seq. ID No. 1241, Seq. ID No. 1315, Seq. ID No. 1331, Seq. ID No. 1369, Seq. ID No. 1459, Seq. ID No. 1517, Seq. ID No. 1561, Seq. ID No. 1563, Seq. ID No. 1567, Seq. ID No. 1571, Seq. ID No. 1573, Seq. ID No. 1601, Seq. ID No. 1607, Seq. ID No. 1613, Seq. ID No. 1619, Seq. ID No. 1641, Seq. ID No. 1647, Seq. ID No. 1653, Seq. ID No. 1657, Seq. ID No. 1665, Seq. ID No. 1699, Seq. ID No. 1713, Seq. ID No. 1751, Seq. ID No. 1771, Seq. ID No. 1785, Seq. ID No. 1789, Seq. ID No. 1791, Seq. ID No. 1797, Seq. ID No. 1811, Seq. ID No. 1817, Seq. ID No. 1819, Seq. ID No. 1821, Seq. ID No. 1871, Seq. ID No. 1895, Seq. ID No. 1905, Seq. ID No. 1913, Seq. ID No. 1919, Seq. ID No. 1923, Seq. ID No. 1965, Seq. ID No. 1971, Seq. ID No. 1999, Seq. ID No. 2047, Seq. ID No. 2055, Seq. ID No. 2091, Seq. ID No. 2093, Seq. ID No. 2115, Seq. ID No. 2119, Seq. ID No. 2127, Seq. ID No. 2165, Seq. ID No. 2179, Seq. ID No. 2207, Seq. ID No. 2223, Seq. ID No. 2227, Seq. ID No. 2241, Seq. ID No. 2253, Seq. ID No. 2263, Seq. ID No. 2269, Seq. ID No. 2275, Seq. ID No. 2301, Seq. ID No. 2315, Seq. ID No. 2329, Seq. ID No. 2333, Seq. ID No. 2343, Seq. ID No. 2345, Seq. ID No. 2363, Seq. ID No. 2373, Seq. ID No. 2391, Seq. ID No. 2417, Seq. ID No. 2429, Seq. ID No. 2465, Seq. ID No. 2475, Seq. ID No. 2483, Seq. ID No. 2513, Seq. ID No. 2525, Seq. ID No. 2589, Seq. ID No. 2613, Seq. ID No. 2651, Seq. ID No. 2669, Seq. ID No. 2677, Seq. ID No. 2687, Seq. ID No. 2689, Seq. ID No. 2693, Seq. ID No. 2703, Seq. ID No. 2709, Seq. ID No. 2715, Seq. ID No. 2751, Seq. ID No. 2753, Seq. ID No. 2767, Seq. ID No. 2787, Seq. ID No. 2791, Seq. ID No. 2803, Seq. ID No. 2867, Seq. ID No. 2871, Seq. ID No. 2907, Seq. ID No. 2919, Seq. ID No. 2921, Seq. ID No. 2923, Seq. ID No. 2927, Seq. ID No. 2933, Seq. ID No. 2957, Seq. ID No. 2979, Seq. ID No. 2999, Seq. ID No. 3005, Seq. ID No. 3019, Seq. ID No. 3031, Seq. ID No. 3035, Seq. ID No. 3055, Seq. ID No. 3067, Seq. ID No. 3085, Seq. ID No. 3165, Seq. ID No. 3183,

Seq. ID No. 3189, Seq. ID No. 3197, Seq. ID No. 3211, Seq. ID No. 3251, Seq.  
ID No. 3257, Seq. ID No. 3259, Seq. ID No. 3297, Seq. ID No. 3319, Seq. ID No.  
3323, Seq. ID No. 3335, Seq. ID No. 3337, Seq. ID No. 3355, Seq. ID No. 3359,  
Seq. ID No. 3377, Seq. ID No. 3397, Seq. ID No. 3405, Seq. ID No. 3415, Seq.  
5 ID No. 3425, Seq. ID No. 3427, Seq. ID No. 3461, Seq. ID No. 3463, Seq. ID No.  
3487, Seq. ID No. 3493, Seq. ID No. 3497, Seq. ID No. 3507, Seq. ID No. 3519,  
Seq. ID No. 3521, Seq. ID No. 3529, Seq. ID No. 3535, Seq. ID No. 3629, Seq.  
ID No. 3635, Seq. ID No. 3727, Seq. ID No. 3759, Seq. ID No. 3771, Seq. ID No.  
3793, Seq. ID No. 3839, Seq. ID No. 3851, Seq. ID No. 3863, Seq. ID No. 3865,  
10 Seq. ID No. 3883, Seq. ID No. 3891, Seq. ID No. 3913, Seq. ID No. 3925, Seq.  
ID No. 3929, Seq. ID No. 3975, Seq. ID No. 3981, Seq. ID No. 4027, Seq. ID No.  
4039, Seq. ID No. 4061, Seq. ID No. 4073, Seq. ID No. 4081, Seq. ID No. 4103,  
Seq. ID No. 4111, Seq. ID No. 4137, Seq. ID No. 4225, Seq. ID No. 4247, Seq.  
ID No. 4343, Seq. ID No. 4379, Seq. ID No. 4389, Seq. ID No. 4469, Seq. ID No.  
15 4473, Seq. ID No. 4481, Seq. ID No. 4485, Seq. ID No. 4493, Seq. ID No. 4529,  
Seq. ID No. 4643, Seq. ID No. 4705, Seq. ID No. 4713, Seq. ID No. 4717, Seq.  
ID No. 4813, Seq. ID No. 4815, Seq. ID No. 4825, Seq. ID No. 4827, Seq. ID No.  
4833, Seq. ID No. 4837, Seq. ID No. 4851, Seq. ID No. 4863, Seq. ID No. 4875,  
Seq. ID No. 4879, Seq. ID No. 4893, Seq. ID No. 4901, Seq. ID No. 4919, Seq.  
20 ID No. 4931, Seq. ID No. 4959, Seq. ID No. 4963, Seq. ID No. 4985, Seq. ID No.  
5113, Seq. ID No. 5115, Seq. ID No. 5117, Seq. ID No. 5125, Seq. ID No. 5141,  
Seq. ID No. 5183, Seq. ID No. 5201, Seq. ID No. 5205, Seq. ID No. 5213, Seq.  
ID No. 5219, Seq. ID No. 5279, Seq. ID No. 5285, Seq. ID No. 5331, Seq. ID No.  
5381, Seq. ID No. 5389, Seq. ID No. 5405, Seq. ID No. 5411, Seq. ID No. 5419,  
25 Seq. ID No. 5433, Seq. ID No. 5463, Seq. ID No. 5477, Seq. ID No. 5491, Seq.  
ID No. 5509, Seq. ID No. 5513, Seq. ID No. 5525, Seq. ID No. 5529, Seq. ID No.  
5537, Seq. ID No. 5567, Seq. ID No. 5599, Seq. ID No. 5621, Seq. ID No. 5637,  
Seq. ID No. 5699, Seq. ID No. 5723, Seq. ID No. 5733, Seq. ID No. 5761, Seq.  
ID No. 5791, Seq. ID No. 5895, Seq. ID No. 5901, Seq. ID No. 5903, Seq. ID No.  
30 5909, Seq. ID No. 5913, Seq. ID No. 5919, Seq. ID No. 5929, Seq. ID No. 5939,  
Seq. ID No. 6001, Seq. ID No. 6043, Seq. ID No. 6053, Seq. ID No. 6057, Seq.  
ID No. 6089, Seq. ID No. 6095, Seq. ID No. 6103, Seq. ID No. 6111, Seq. ID No.  
6117, Seq. ID No. 6165, Seq. ID No. 6169, Seq. ID No. 6185, Seq. ID No. 6191,



Seq. ID No. 6209, Seq. ID No. 6229, Seq. ID No. 6257, Seq. ID No. 6263, Seq. ID No. 6271, Seq. ID No. 6275, Seq. ID No. 6289, Seq. ID No. 6303, Seq. ID No. 6365, Seq. ID No. 6369, Seq. ID No. 6383, and Seq. ID No. 6415.

- 5     18.     The polynucleotide of claim 7, wherein the polynucleotide has been identified using the proteomic methods used for studying surface exposed proteins of *Streptococcus pneumoniae* as encoding a polypeptide, and the polynucleotide is selected from one of Seq. ID No. 1, Seq. ID No. 5, Seq. ID No. 93, Seq. ID No. 95, Seq. ID No. 103, Seq. ID No. 107, Seq. ID No. 157, Seq. ID No. 223, Seq. ID No. 225, Seq. ID No. 233, Seq. ID No. 239, Seq. ID No. 253, Seq. ID No. 317, Seq. ID No. 321, Seq. ID No. 341, Seq. ID No. 345, Seq. ID No. 353, Seq. ID No. 361, Seq. ID No. 363, Seq. ID No. 365, Seq. ID No. 375, Seq. ID No. 379, Seq. ID No. 383, Seq. ID No. 389, Seq. ID No. 391, Seq. ID No. 397, Seq. ID No. 405, Seq. ID No. 409, Seq. ID No. 415, Seq. ID No. 423, Seq. ID No. 425, Seq. ID No. 427, Seq. ID No. 429, Seq. ID No. 435, Seq. ID No. 437, Seq. ID No. 439, Seq. ID No. 441, Seq. ID No. 443, Seq. ID No. 445, Seq. ID No. 447, Seq. ID No. 449, Seq. ID No. 461, Seq. ID No. 463, Seq. ID No. 465, Seq. ID No. 513, Seq. ID No. 543, Seq. ID No. 551, Seq. ID No. 553, Seq. ID No. 559, Seq. ID No. 595, Seq. ID No. 601, Seq. ID No. 637, Seq. ID No. 649, Seq. ID No. 657, Seq. ID No. 669, Seq. ID No. 675, Seq. ID No. 683, Seq. ID No. 753, Seq. ID No. 929, Seq. ID No. 969, Seq. ID No. 1041, Seq. ID No. 1043, Seq. ID No. 1085, Seq. ID No. 1089, Seq. ID No. 1093, Seq. ID No. 1097, Seq. ID No. 1099, Seq. ID No. 1101, Seq. ID No. 1175, Seq. ID No. 1205, Seq. ID No. 1237, Seq. ID No. 1459, Seq. ID No. 1495, Seq. ID No. 1497, Seq. ID No. 1503, Seq. ID No. 1517, Seq. ID No. 1527, Seq. ID No. 1531, Seq. ID No. 1539, Seq. ID No. 1543, Seq. ID No. 1549, Seq. ID No. 1573, Seq. ID No. 1657, Seq. ID No. 1709, Seq. ID No. 1767, Seq. ID No. 1785, Seq. ID No. 1821, Seq. ID No. 1889, Seq. ID No. 1925, Seq. ID No. 1969, Seq. ID No. 2003, Seq. ID No. 2047, Seq. ID No. 2075, Seq. ID No. 2089, Seq. ID No. 2093, Seq. ID No. 2117, Seq. ID No. 2137, Seq. ID No. 2143, Seq. ID No. 2205, Seq. ID No. 2235, Seq. ID No. 2257, Seq. ID No. 2301, Seq. ID No. 2363, Seq. ID No. 2423, Seq. ID No. 2445, Seq. ID No. 2451, Seq. ID No. 2481, Seq. ID No. 2495, Seq. ID No. 2505, Seq. ID No. 2577, Seq. ID No. 2587, Seq. ID No. 2613, Seq. ID No. 2633, Seq. ID No. 2651, Seq. ID No. 2665, Seq. ID No. 2669,

Seq. ID No. 2677, Seq. ID No. 2687, Seq. ID No. 2693, Seq. ID No. 2699, Seq. ID No. 2711, Seq. ID No. 2715, Seq. ID No. 2757, Seq. ID No. 2791, Seq. ID No. 2793, Seq. ID No. 2803, Seq. ID No. 2867, Seq. ID No. 2919, Seq. ID No. 2929, Seq. ID No. 3005, Seq. ID No. 3019, Seq. ID No. 3125, Seq. ID No. 3137, Seq. ID No. 3161, Seq. ID No. 3179, Seq. ID No. 3251, Seq. ID No. 3259, Seq. ID No. 3285, Seq. ID No. 3309, Seq. ID No. 3317, Seq. ID No. 3337, Seq. ID No. 3345, Seq. ID No. 3359, Seq. ID No. 3475, Seq. ID No. 3515, Seq. ID No. 3521, Seq. ID No. 3641, Seq. ID No. 3695, Seq. ID No. 3793, Seq. ID No. 3901, Seq. ID No. 3927, Seq. ID No. 3987, Seq. ID No. 4001, Seq. ID No. 4057, Seq. ID No. 4081, Seq. ID No. 4111, Seq. ID No. 4125, Seq. ID No. 4193, Seq. ID No. 4195, Seq. ID No. 4237, Seq. ID No. 4247, Seq. ID No. 4383, Seq. ID No. 4393, Seq. ID No. 4397, Seq. ID No. 4401, Seq. ID No. 4435, Seq. ID No. 4449, Seq. ID No. 4471, Seq. ID No. 4491, Seq. ID No. 4511, Seq. ID No. 4519, Seq. ID No. 4531, Seq. ID No. 4549, Seq. ID No. 4577, Seq. ID No. 4581, Seq. ID No. 4585, Seq. ID No. 4609, Seq. ID No. 4611, Seq. ID No. 4613, Seq. ID No. 4675, Seq. ID No. 4685, Seq. ID No. 4719, Seq. ID No. 4729, Seq. ID No. 4743, Seq. ID No. 4755, Seq. ID No. 4781, Seq. ID No. 4787, Seq. ID No. 4837, Seq. ID No. 4841, Seq. ID No. 4849, Seq. ID No. 4855, Seq. ID No. 4889, Seq. ID No. 4901, Seq. ID No. 4915, Seq. ID No. 4917, Seq. ID No. 4931, Seq. ID No. 4935, Seq. ID No. 4977, Seq. ID No. 5025, Seq. ID No. 5029, Seq. ID No. 5109, Seq. ID No. 5115, Seq. ID No. 5117, Seq. ID No. 5155, Seq. ID No. 5185, Seq. ID No. 5201, Seq. ID No. 5203, Seq. ID No. 5219, Seq. ID No. 5261, Seq. ID No. 5289, Seq. ID No. 5295, Seq. ID No. 5377, Seq. ID No. 5389, Seq. ID No. 5399, Seq. ID No. 5411, Seq. ID No. 5537, Seq. ID No. 5621, Seq. ID No. 5627, Seq. ID No. 5657, Seq. ID No. 5675, Seq. ID No. 5717, Seq. ID No. 5777, Seq. ID No. 5859, Seq. ID No. 5901, Seq. ID No. 5913, Seq. ID No. 5919, Seq. ID No. 5925, Seq. ID No. 5933, Seq. ID No. 6055, Seq. ID No. 6129, Seq. ID No. 6133, Seq. ID No. 6187, Seq. ID No. 6193, Seq. ID No. 6219, Seq. ID No. 6271, Seq. ID No. 6277, Seq. ID No. 6369, Seq. ID No. 6375, Seq. ID No. 6379, Seq. ID No. 6389, Seq. ID No. 6591, and Seq. ID No. 6605.

19. The polynucleotide of claim 7, wherein the polypeptide encoded by the polynucleotide was identified using HMM LPXTG motif finder as having a LPXTG

motif and wherein the polypeptide is covalently attached to the peptidoglycan layer, and the polynucleotide is selected from one of Seq. ID No. 503, Seq. ID No. 505, Seq. ID No. 1315, Seq. ID No. 1317, Seq. ID No. 1363, Seq. ID No. 1365, Seq. ID No. 1367, Seq. ID No. 1369, Seq. ID No. 1559, Seq. ID No. 1561, Seq. ID No. 1581, Seq. ID No. 1739, Seq. ID No. 1741, Seq. ID No. 2811, Seq. ID No. 2813, Seq. ID No. 3619, Seq. ID No. 5587, Seq. ID No. 5589, Seq. ID No. 5591, Seq. ID No. 5781, Seq. ID No. 5783, and Seq. ID No. 6103.

20. The polynucleotide of claim 7, wherein the polynucleotide encodes a lipoprotein as predicted by HMM Lipo software program, and the polynucleotide is selected from one of Seq. ID No. 45, Seq. ID No. 47, Seq. ID No. 171, Seq. ID No. 225, Seq. ID No. 419, Seq. ID No. 513, Seq. ID No. 575, Seq. ID No. 591, Seq. ID No. 593, Seq. ID No. 657, Seq. ID No. 659, Seq. ID No. 669, Seq. ID No. 675, Seq. ID No. 745, Seq. ID No. 747, Seq. ID No. 935, Seq. ID No. 1045, Seq. ID No. 1075, Seq. ID No. 1137, Seq. ID No. 1173, Seq. ID No. 1191, Seq. ID No. 1193, Seq. ID No. 1195, Seq. ID No. 1563, Seq. ID No. 1661, Seq. ID No. 1663, Seq. ID No. 1665, Seq. ID No. 1791, Seq. ID No. 1797, Seq. ID No. 1917, Seq. ID No. 1969, Seq. ID No. 2115, Seq. ID No. 2159, Seq. ID No. 2429, Seq. ID No. 2527, Seq. ID No. 2699, Seq. ID No. 2815, Seq. ID No. 2875, Seq. ID No. 2975, Seq. ID No. 2977, Seq. ID No. 2991, Seq. ID No. 3043, Seq. ID No. 3323, Seq. ID No. 3337, Seq. ID No. 4133, Seq. ID No. 4137, Seq. ID No. 4481, Seq. ID No. 4705, Seq. ID No. 4827, Seq. ID No. 4869, Seq. ID No. 5115, Seq. ID No. 5377, Seq. ID No. 5379, Seq. ID No. 5491, Seq. ID No. 5509, Seq. ID No. 5513, Seq. ID No. 5525, Seq. ID No. 5529, Seq. ID No. 5531, Seq. ID No. 5889, Seq. ID No. 5909, Seq. ID No. 6025, Seq. ID No. 6027, Seq. ID No. 6087, Seq. ID No. 6089, Seq. ID No. 6325, Seq. ID No. 6327, Seq. ID No. 6415, Seq. ID No. 6637, Seq. ID No. 6639, and Seq. ID No. 6645.

21 The polynucleotide of claim 7, wherein the polypeptide encoded by the polynucleotide is predicted by HMM program to be non-covalently bound to the peptidoglycan layer, and the polynucleotide is selected from one of Seq. ID No. 3589, Seq. ID No. 3987, Seq. ID No. 5219, and Seq. ID No. 5337.

22. The polynucleotide of claim 7, wherein the polynucleotide encodes a polypeptide having a RGD<sub>X</sub> motif wherein X is not a proline, and the polynucleotide is selected from one of Seq. ID No. 37, Seq. ID No. 99, Seq. ID No. 107, Seq. ID No. 109, Seq. ID No. 111, Seq. ID No. 351, Seq. ID No. 353, Seq. ID No. 465, Seq. ID No. 467, Seq. ID No. 469, Seq. ID No. 471, Seq. ID No. 683, Seq. ID No. 821, Seq. ID No. 823, Seq. ID No. 1021, Seq. ID No. 1023, Seq. ID No. 1157, Seq. ID No. 1159, Seq. ID No. 1233, Seq. ID No. 1333, Seq. ID No. 1335, Seq. ID No. 1449, Seq. ID No. 1559, Seq. ID No. 1561, Seq. ID No. 1563, Seq. ID No. 1625, Seq. ID No. 1777, Seq. ID No. 1827, Seq. ID No. 1829, Seq. ID No. 1871, Seq. ID No. 1925, Seq. ID No. 2135, Seq. ID No. 2145, Seq. ID No. 2173, Seq. ID No. 2175, Seq. ID No. 2177, Seq. ID No. 2179, Seq. ID No. 2259, Seq. ID No. 2317, Seq. ID No. 2319, Seq. ID No. 2321, Seq. ID No. 2323, Seq. ID No. 2325, Seq. ID No. 2327, Seq. ID No. 2329, Seq. ID No. 2401, Seq. ID No. 2671, Seq. ID No. 2863, Seq. ID No. 2869, Seq. ID No. 2919, Seq. ID No. 2921, Seq. ID No. 2993, Seq. ID No. 3087, Seq. ID No. 3137, Seq. ID No. 3279, Seq. ID No. 3281, Seq. ID No. 3283, Seq. ID No. 3333, Seq. ID No. 3335, Seq. ID No. 3497, Seq. ID No. 3499, Seq. ID No. 3501, Seq. ID No. 3533, Seq. ID No. 3671, Seq. ID No. 3673, Seq. ID No. 3675, Seq. ID No. 3837, Seq. ID No. 3839, Seq. ID No. 3841, Seq. ID No. 3843, Seq. ID No. 3929, Seq. ID No. 3961, Seq. ID No. 4037, Seq. ID No. 4193, Seq. ID No. 4239, Seq. ID No. 4327, Seq. ID No. 4329, Seq. ID No. 4333, Seq. ID No. 4393, Seq. ID No. 4463, Seq. ID No. 4465, Seq. ID No. 4467, Seq. ID No. 4597, Seq. ID No. 4629, Seq. ID No. 4631, Seq. ID No. 4675, Seq. ID No. 4677, Seq. ID No. 4679, Seq. ID No. 4689, Seq. ID No. 4691, Seq. ID No. 4693, Seq. ID No. 4781, Seq. ID No. 4799, Seq. ID No. 4801, Seq. ID No. 4803, Seq. ID No. 4861, Seq. ID No. 5009, Seq. ID No. 5143, Seq. ID No. 5145, Seq. ID No. 5179, Seq. ID No. 5181, Seq. ID No. 5183, Seq. ID No. 5249, Seq. ID No. 5251, Seq. ID No. 5253, Seq. ID No. 5259, Seq. ID No. 5261, Seq. ID No. 5293, Seq. ID No. 5295, Seq. ID No. 5297, Seq. ID No. 5299, Seq. ID No. 5307, Seq. ID No. 5309, Seq. ID No. 5411, Seq. ID No. 5535, Seq. ID No. 5537, Seq. ID No. 5745, Seq. ID No. 5821, Seq. ID No. 5823, Seq. ID No. 5825, Seq. ID No. 6029, Seq. ID No. 6171, Seq. ID No. 6307, Seq. ID No. 6309, and Seq. ID No. 6311.

23. The polynucleotide of claim 7, wherein the polynucleotide encodes a polypeptide that is predicted by BlastP analysis as being involved in capsule biosynthesis and transport, and the polynucleotide is selected from one of Seq. ID No. 49, Seq. ID No. 51, Seq. ID No. 53, Seq. ID No. 59, Seq. ID No. 195, Seq. ID No. 689, Seq. ID No. 703, Seq. ID No. 925, Seq. ID No. 1597, Seq. ID No. 1601, Seq. ID No. 1607, Seq. ID No. 1611, Seq. ID No. 1613, Seq. ID No. 1713, Seq. ID No. 2029, Seq. ID No. 2263, Seq. ID No. 2269, Seq. ID No. 2373, Seq. ID No. 2437, Seq. ID No. 2651, Seq. ID No. 2767, Seq. ID No. 2907, Seq. ID No. 3397, Seq. ID No. 3399, Seq. ID No. 3479, Seq. ID No. 3487, Seq. ID No. 3491, Seq. ID No. 3493, Seq. ID No. 3495, Seq. ID No. 3497, Seq. ID No. 3519, Seq. ID No. 3521, Seq. ID No. 3529, Seq. ID No. 3535, Seq. ID No. 3561, Seq. ID No. 3883, Seq. ID No. 3891, Seq. ID No. 3981, and Seq. ID No. 4087.
24. The polynucleotide of claim 7, wherein the polynucleotide encodes a polypeptide identified by BlastP analysis as being localized within the capsular loci of the *Alloiococcus otitidis* genome, and the polynucleotide is selected from one of Seq. ID No. 45, Seq. ID No. 47, Seq. ID No. 51, Seq. ID No. 53, Seq. ID No. 55, Seq. ID No. 57, Seq. ID No. 59, Seq. ID No. 683, Seq. ID No. 685, Seq. ID No. 687, Seq. ID No. 689, Seq. ID No. 691, Seq. ID No. 693, Seq. ID No. 695, Seq. ID No. 697, Seq. ID No. 699, Seq. ID No. 701, Seq. ID No. 703, Seq. ID No. 705, Seq. ID No. 707, Seq. ID No. 709, Seq. ID No. 711, Seq. ID No. 713, Seq. ID No. 715, Seq. ID No. 717, Seq. ID No. 719, Seq. ID No. 721, Seq. ID No. 723, Seq. ID No. 725, Seq. ID No. 727, Seq. ID No. 729, Seq. ID No. 731, Seq. ID No. 733, Seq. ID No. 735, Seq. ID No. 737, Seq. ID No. 739, Seq. ID No. 741, Seq. ID No. 743, Seq. ID No. 745, Seq. ID No. 747, Seq. ID No. 749, Seq. ID No. 751, Seq. ID No. 753, Seq. ID No. 3389, Seq. ID No. 3391, Seq. ID No. 3393, Seq. ID No. 3395, Seq. ID No. 3397, Seq. ID No. 3399, Seq. ID No. 3401, Seq. ID No. 3403, Seq. ID No. 3405, Seq. ID No. 3407, Seq. ID No. 3409, Seq. ID No. 3411, Seq. ID No. 3413, Seq. ID No. 3415, Seq. ID No. 3417, Seq. ID No. 3419, Seq. ID No. 3421, Seq. ID No. 3423, Seq. ID No. 3425, Seq. ID No. 3427, Seq. ID No. 3429, Seq. ID No. 3431, Seq. ID No. 3433, Seq. ID No. 3435, Seq. ID No. 3437, Seq. ID No. 3439, Seq. ID No. 3441, Seq. ID No. 3443, Seq. ID No. 3445, Seq. ID No. 3447, Seq. ID No. 3449, Seq. ID No. 3451, Seq. ID No. 3453, Seq. ID No. 3455, Seq.

5 ID No. 3457, Seq. ID No. 3459, Seq. ID No. 3461, Seq. ID No. 3463, Seq. ID No. 3465, Seq. ID No. 3467, Seq. ID No. 3469, Seq. ID No. 3471, Seq. ID No. 3473, Seq. ID No. 3475, Seq. ID No. 3477, Seq. ID No. 3479, Seq. ID No. 3481, Seq. ID No. 3483, Seq. ID No. 3485, Seq. ID No. 3487, Seq. ID No. 3489, Seq. ID No. 3491, Seq. ID No. 3493, Seq. ID No. 3495, Seq. ID No. 3497, Seq. ID No. 3499, Seq. ID No. 3501, Seq. ID No. 3503, Seq. ID No. 3505, Seq. ID No. 3507, Seq. ID No. 3509, Seq. ID No. 3511, Seq. ID No. 3513, Seq. ID No. 3515, Seq. ID No. 3517, Seq. ID No. 3519, Seq. ID No. 3521, Seq. ID No. 3523, Seq. ID No. 3525, Seq. ID No. 3527, Seq. ID No. 3529, Seq. ID No. 3531, Seq. ID No. 3533, Seq. ID No. 3535, Seq. ID No. 3537, Seq. ID No. 3539, Seq. ID No. 3541, Seq. ID No. 3543, Seq. ID No. 3545, Seq. ID No. 3547, Seq. ID No. 3549, Seq. ID No. 3551, Seq. ID No. 3553, Seq. ID No. 3555, Seq. ID No. 3557, Seq. ID No. 3559, and Seq. ID No. 3561.

15 25. The polynucleotide of claim 7, wherein the polynucleotide encodes a polypeptide identified by BlastP analysis as being associated with sporulation, and the polynucleotide is selected from one of Seq. ID No. 1137, Seq. ID No. 1455, Seq. ID No. 2137, Seq. ID No. 2141, Seq. ID No. 2165, Seq. ID No. 2179, Seq. ID No. 2301, Seq. ID No. 2753, Seq. ID No. 4211, Seq. ID No. 4251, Seq. ID No. 4327, Seq. ID No. 4569, Seq. ID No. 4719, and Seq. ID No. 4729.

26. The polynucleotide of claim 7, wherein the polynucleotide is a unique ORF identified by BlastP analysis as having a BlastP 'E' value of  $>e^{-10}$ , and the polynucleotide is selected from one of Seq. ID No. 7, Seq. ID No. 19, Seq. ID No. 21, Seq. ID No. 23, Seq. ID No. 31, Seq. ID No. 39, Seq. ID No. 65, Seq. ID No. 67, Seq. ID No. 69, Seq. ID No. 91, Seq. ID No. 99, Seq. ID No. 105, Seq. ID No. 113, Seq. ID No. 115, Seq. ID No. 123, Seq. ID No. 125, Seq. ID No. 127, Seq. ID No. 131, Seq. ID No. 133, Seq. ID No. 139, Seq. ID No. 151, Seq. ID No. 159, Seq. ID No. 161, Seq. ID No. 163, Seq. ID No. 165, Seq. ID No. 169, Seq. ID No. 185, Seq. ID No. 189, Seq. ID No. 193, Seq. ID No. 229, Seq. ID No. 231, Seq. ID No. 255, Seq. ID No. 257, Seq. ID No. 259, Seq. ID No. 275, Seq. ID No. 337, Seq. ID No. 339, Seq. ID No. 347, Seq. ID No. 349, Seq. ID No. 357, Seq. ID No. 359, Seq. ID No. 369, Seq. ID No. 371, Seq. ID No. 377, Seq. ID No. 385, Seq.

5 ID No. 387, Seq. ID No. 393, Seq. ID No. 399, Seq. ID No. 401, Seq. ID No. 403,  
Seq. ID No. 407, Seq. ID No. 419, Seq. ID No. 431, Seq. ID No. 477, Seq. ID No.  
495, Seq. ID No. 507, Seq. ID No. 519, Seq. ID No. 541, Seq. ID No. 545, Seq.  
ID No. 547, Seq. ID No. 549, Seq. ID No. 557, Seq. ID No. 589, Seq. ID No. 617,  
Seq. ID No. 619, Seq. ID No. 633, Seq. ID No. 639, Seq. ID No. 641, Seq. ID No.  
643, Seq. ID No. 645, Seq. ID No. 647, Seq. ID No. 651, Seq. ID No. 653, Seq.  
ID No. 655, Seq. ID No. 667, Seq. ID No. 691, Seq. ID No. 693, Seq. ID No. 695,  
Seq. ID No. 697, Seq. ID No. 715, Seq. ID No. 717, Seq. ID No. 719, Seq. ID No.  
731, Seq. ID No. 733, Seq. ID No. 741, Seq. ID No. 743, Seq. ID No. 745, Seq.  
10 ID No. 747, Seq. ID No. 749, Seq. ID No. 751, Seq. ID No. 755, Seq. ID No. 757,  
Seq. ID No. 759, Seq. ID No. 761, Seq. ID No. 763, Seq. ID No. 765, Seq. ID No.  
767, Seq. ID No. 801, Seq. ID No. 803, Seq. ID No. 805, Seq. ID No. 807, Seq.  
ID No. 809, Seq. ID No. 811, Seq. ID No. 813, Seq. ID No. 833, Seq. ID No. 841,  
Seq. ID No. 849, Seq. ID No. 851, Seq. ID No. 853, Seq. ID No. 855, Seq. ID No.  
15 887, Seq. ID No. 889, Seq. ID No. 891, Seq. ID No. 903, Seq. ID No. 905, Seq.  
ID No. 909, Seq. ID No. 937, Seq. ID No. 941, Seq. ID No. 943, Seq. ID No. 951,  
Seq. ID No. 957, Seq. ID No. 973, Seq. ID No. 975, Seq. ID No. 987, Seq. ID No.  
1005, Seq. ID No. 1007, Seq. ID No. 1009, Seq. ID No. 1011, Seq. ID No. 1019,  
Seq. ID No. 1025, Seq. ID No. 1027, Seq. ID No. 1045, Seq. ID No. 1047, Seq.  
20 ID No. 1071, Seq. ID No. 1073, Seq. ID No. 1077, Seq. ID No. 1105, Seq. ID No.  
1107, Seq. ID No. 1111, Seq. ID No. 1131, Seq. ID No. 1135, Seq. ID No. 1139,  
Seq. ID No. 1151, Seq. ID No. 1153, Seq. ID No. 1165, Seq. ID No. 1167, Seq.  
ID No. 1169, Seq. ID No. 1171, Seq. ID No. 1173, Seq. ID No. 1181, Seq. ID No.  
1183, Seq. ID No. 1185, Seq. ID No. 1187, Seq. ID No. 1189, Seq. ID No. 1191,  
25 Seq. ID No. 1193, Seq. ID No. 1195, Seq. ID No. 1197, Seq. ID No. 1199, Seq.  
ID No. 1201, Seq. ID No. 1203, Seq. ID No. 1207, Seq. ID No. 1213, Seq. ID No.  
1227, Seq. ID No. 1229, Seq. ID No. 1239, Seq. ID No. 1243, Seq. ID No. 1245,  
Seq. ID No. 1247, Seq. ID No. 1249, Seq. ID No. 1259, Seq. ID No. 1265, Seq.  
ID No. 1267, Seq. ID No. 1269, Seq. ID No. 1271, Seq. ID No. 1273, Seq. ID No.  
30 1275, Seq. ID No. 1277, Seq. ID No. 1279, Seq. ID No. 1281, Seq. ID No. 1283,  
Seq. ID No. 1285, Seq. ID No. 1287, Seq. ID No. 1289, Seq. ID No. 1291, Seq.  
ID No. 1293, Seq. ID No. 1295, Seq. ID No. 1297, Seq. ID No. 1299, Seq. ID No.  
1301, Seq. ID No. 1303, Seq. ID No. 1305, Seq. ID No. 1307, Seq. ID No. 1309,

Seq. ID No. 1311, Seq. ID No. 1313, Seq. ID No. 1319, Seq. ID No. 1321, Seq.  
ID No. 1323, Seq. ID No. 1325, Seq. ID No. 1327, Seq. ID No. 1337, Seq. ID No.  
1341, Seq. ID No. 1343, Seq. ID No. 1347, Seq. ID No. 1349, Seq. ID No. 1351,  
Seq. ID No. 1353, Seq. ID No. 1355, Seq. ID No. 1371, Seq. ID No. 1379, Seq.  
5 ID No. 1381, Seq. ID No. 1389, Seq. ID No. 1397, Seq. ID No. 1399, Seq. ID No.  
1401, Seq. ID No. 1417, Seq. ID No. 1419, Seq. ID No. 1421, Seq. ID No. 1423,  
Seq. ID No. 1439, Seq. ID No. 1445, Seq. ID No. 1447, Seq. ID No. 1457, Seq.  
ID No. 1465, Seq. ID No. 1479, Seq. ID No. 1511, Seq. ID No. 1551, Seq. ID No.  
1553, Seq. ID No. 1555, Seq. ID No. 1557, Seq. ID No. 1579, Seq. ID No. 1609,  
10 Seq. ID No. 1621, Seq. ID No. 1623, Seq. ID No. 1625, Seq. ID No. 1627, Seq.  
ID No. 1629, Seq. ID No. 1631, Seq. ID No. 1633, Seq. ID No. 1639, Seq. ID No.  
1643, Seq. ID No. 1655, Seq. ID No. 1667, Seq. ID No. 1671, Seq. ID No. 1693,  
Seq. ID No. 1695, Seq. ID No. 1701, Seq. ID No. 1703, Seq. ID No. 1705, Seq.  
ID No. 1721, Seq. ID No. 1723, Seq. ID No. 1731, Seq. ID No. 1737, Seq. ID No.  
15 1743, Seq. ID No. 1759, Seq. ID No. 1763, Seq. ID No. 1773, Seq. ID No. 1775,  
Seq. ID No. 1777, Seq. ID No. 1779, Seq. ID No. 1781, Seq. ID No. 1799, Seq.  
ID No. 1801, Seq. ID No. 1803, Seq. ID No. 1807, Seq. ID No. 1823, Seq. ID No.  
1831, Seq. ID No. 1851, Seq. ID No. 1857, Seq. ID No. 1875, Seq. ID No. 1899,  
Seq. ID No. 1915, Seq. ID No. 1927, Seq. ID No. 1929, Seq. ID No. 1973, Seq.  
20 ID No. 1977, Seq. ID No. 1981, Seq. ID No. 2005, Seq. ID No. 2007, Seq. ID No.  
2009, Seq. ID No. 2011, Seq. ID No. 2017, Seq. ID No. 2019, Seq. ID No. 2023,  
Seq. ID No. 2025, Seq. ID No. 2027, Seq. ID No. 2039, Seq. ID No. 2041, Seq.  
ID No. 2043, Seq. ID No. 2045, Seq. ID No. 2049, Seq. ID No. 2081, Seq. ID No.  
2083, Seq. ID No. 2085, Seq. ID No. 2105, Seq. ID No. 2107, Seq. ID No. 2109,  
25 Seq. ID No. 2111, Seq. ID No. 2129, Seq. ID No. 2131, Seq. ID No. 2133, Seq.  
ID No. 2145, Seq. ID No. 2155, Seq. ID No. 2157, Seq. ID No. 2159, Seq. ID No.  
2161, Seq. ID No. 2171, Seq. ID No. 2187, Seq. ID No. 2189, Seq. ID No. 2201,  
Seq. ID No. 2203, Seq. ID No. 2209, Seq. ID No. 2211, Seq. ID No. 2219, Seq.  
ID No. 2225, Seq. ID No. 2243, Seq. ID No. 2245, Seq. ID No. 2247, Seq. ID No.  
30 2249, Seq. ID No. 2251, Seq. ID No. 2255, Seq. ID No. 2277, Seq. ID No. 2279,  
Seq. ID No. 2341, Seq. ID No. 2351, Seq. ID No. 2353, Seq. ID No. 2355, Seq.  
ID No. 2357, Seq. ID No. 2359, Seq. ID No. 2365, Seq. ID No. 2367, Seq. ID No.  
2371, Seq. ID No. 2375, Seq. ID No. 2393, Seq. ID No. 2395, Seq. ID No. 2425,



Seq. ID No. 2427, Seq. ID No. 2431, Seq. ID No. 2439, Seq. ID No. 2441, Seq.  
ID No. 2443, Seq. ID No. 2447, Seq. ID No. 2459, Seq. ID No. 2479, Seq. ID No.  
2493, Seq. ID No. 2501, Seq. ID No. 2503, Seq. ID No. 2521, Seq. ID No. 2523,  
Seq. ID No. 2527, Seq. ID No. 2591, Seq. ID No. 2601, Seq. ID No. 2603, Seq.  
5 ID No. 2611, Seq. ID No. 2627, Seq. ID No. 2629, Seq. ID No. 2653, Seq. ID No.  
2661, Seq. ID No. 2691, Seq. ID No. 2695, Seq. ID No. 2697, Seq. ID No. 2717,  
Seq. ID No. 2729, Seq. ID No. 2731, Seq. ID No. 2733, Seq. ID No. 2735, Seq.  
ID No. 2739, Seq. ID No. 2741, Seq. ID No. 2743, Seq. ID No. 2777, Seq. ID No.  
2779, Seq. ID No. 2781, Seq. ID No. 2783, Seq. ID No. 2801, Seq. ID No. 2805,  
10 Seq. ID No. 2807, Seq. ID No. 2809, Seq. ID No. 2811, Seq. ID No. 2813, Seq.  
ID No. 2815, Seq. ID No. 2817, Seq. ID No. 2819, Seq. ID No. 2829, Seq. ID No.  
2831, Seq. ID No. 2833, Seq. ID No. 2835, Seq. ID No. 2837, Seq. ID No. 2839,  
Seq. ID No. 2841, Seq. ID No. 2845, Seq. ID No. 2849, Seq. ID No. 2851, Seq.  
ID No. 2853, Seq. ID No. 2855, Seq. ID No. 2857, Seq. ID No. 2859, Seq. ID No.  
15 2861, Seq. ID No. 2865, Seq. ID No. 2873, Seq. ID No. 2875, Seq. ID No. 2877,  
Seq. ID No. 2883, Seq. ID No. 2885, Seq. ID No. 2887, Seq. ID No. 2889, Seq.  
ID No. 2893, Seq. ID No. 2895, Seq. ID No. 2903, Seq. ID No. 2909, Seq. ID No.  
2935, Seq. ID No. 2937, Seq. ID No. 2939, Seq. ID No. 2941, Seq. ID No. 2943,  
Seq. ID No. 2945, Seq. ID No. 2947, Seq. ID No. 2949, Seq. ID No. 2951, Seq.  
20 ID No. 2953, Seq. ID No. 2965, Seq. ID No. 2967, Seq. ID No. 2973, Seq. ID No.  
2975, Seq. ID No. 2977, Seq. ID No. 2981, Seq. ID No. 2983, Seq. ID No. 2985,  
Seq. ID No. 2987, Seq. ID No. 2989, Seq. ID No. 2991, Seq. ID No. 3001, Seq.  
ID No. 3007, Seq. ID No. 3009, Seq. ID No. 3011, Seq. ID No. 3021, Seq. ID No.  
3023, Seq. ID No. 3041, Seq. ID No. 3045, Seq. ID No. 3071, Seq. ID No. 3087,  
25 Seq. ID No. 3105, Seq. ID No. 3107, Seq. ID No. 3119, Seq. ID No. 3121, Seq.  
ID No. 3123, Seq. ID No. 3151, Seq. ID No. 3153, Seq. ID No. 3167, Seq. ID No.  
3173, Seq. ID No. 3175, Seq. ID No. 3177, Seq. ID No. 3181, Seq. ID No. 3193,  
Seq. ID No. 3213, Seq. ID No. 3215, Seq. ID No. 3217, Seq. ID No. 3219, Seq.  
ID No. 3221, Seq. ID No. 3223, Seq. ID No. 3231, Seq. ID No. 3233, Seq. ID No.  
30 3235, Seq. ID No. 3237, Seq. ID No. 3239, Seq. ID No. 3241, Seq. ID No. 3243,  
Seq. ID No. 3245, Seq. ID No. 3247, Seq. ID No. 3249, Seq. ID No. 3261, Seq.  
ID No. 3263, Seq. ID No. 3265, Seq. ID No. 3267, Seq. ID No. 3269, Seq. ID No.  
3271, Seq. ID No. 3273, Seq. ID No. 3275, Seq. ID No. 3277, Seq. ID No. 3325,

Seq. ID No. 3331, Seq. ID No. 3339, Seq. ID No. 3341, Seq. ID No. 3349, Seq.  
ID No. 3361, Seq. ID No. 3363, Seq. ID No. 3369, Seq. ID No. 3371, Seq. ID No.  
3389, Seq. ID No. 3403, Seq. ID No. 3417, Seq. ID No. 3419, Seq. ID No. 3421,  
Seq. ID No. 3433, Seq. ID No. 3437, Seq. ID No. 3441, Seq. ID No. 3443, Seq.  
5 ID No. 3445, Seq. ID No. 3447, Seq. ID No. 3473, Seq. ID No. 3481, Seq. ID No.  
3483, Seq. ID No. 3489, Seq. ID No. 3503, Seq. ID No. 3505, Seq. ID No. 3509,  
Seq. ID No. 3511, Seq. ID No. 3523, Seq. ID No. 3525, Seq. ID No. 3531, Seq.  
ID No. 3533, Seq. ID No. 3539, Seq. ID No. 3541, Seq. ID No. 3543, Seq. ID No.  
3545, Seq. ID No. 3547, Seq. ID No. 3555, Seq. ID No. 3557, Seq. ID No. 3563,  
10 Seq. ID No. 3565, Seq. ID No. 3571, Seq. ID No. 3573, Seq. ID No. 3581, Seq.  
ID No. 3587, Seq. ID No. 3591, Seq. ID No. 3593, Seq. ID No. 3595, Seq. ID No.  
3611, Seq. ID No. 3613, Seq. ID No. 3617, Seq. ID No. 3619, Seq. ID No. 3621,  
Seq. ID No. 3623, Seq. ID No. 3625, Seq. ID No. 3631, Seq. ID No. 3637, Seq.  
ID No. 3639, Seq. ID No. 3655, Seq. ID No. 3657, Seq. ID No. 3659, Seq. ID No.  
15 3661, Seq. ID No. 3677, Seq. ID No. 3679, Seq. ID No. 3683, Seq. ID No. 3685,  
Seq. ID No. 3701, Seq. ID No. 3703, Seq. ID No. 3717, Seq. ID No. 3719, Seq.  
ID No. 3721, Seq. ID No. 3723, Seq. ID No. 3729, Seq. ID No. 3731, Seq. ID No.  
3733, Seq. ID No. 3735, Seq. ID No. 3737, Seq. ID No. 3739, Seq. ID No. 3741,  
Seq. ID No. 3749, Seq. ID No. 3751, Seq. ID No. 3753, Seq. ID No. 3755, Seq.  
20 ID No. 3761, Seq. ID No. 3781, Seq. ID No. 3783, Seq. ID No. 3785, Seq. ID No.  
3787, Seq. ID No. 3789, Seq. ID No. 3791, Seq. ID No. 3799, Seq. ID No. 3807,  
Seq. ID No. 3809, Seq. ID No. 3811, Seq. ID No. 3813, Seq. ID No. 3815, Seq.  
ID No. 3817, Seq. ID No. 3827, Seq. ID No. 3829, Seq. ID No. 3831, Seq. ID No.  
3833, Seq. ID No. 3835, Seq. ID No. 3849, Seq. ID No. 3879, Seq. ID No. 3881,  
25 Seq. ID No. 3895, Seq. ID No. 3903, Seq. ID No. 3909, Seq. ID No. 3915, Seq.  
ID No. 3939, Seq. ID No. 3959, Seq. ID No. 3961, Seq. ID No. 3963, Seq. ID No.  
3965, Seq. ID No. 3973, Seq. ID No. 3977, Seq. ID No. 3979, Seq. ID No. 3993,  
Seq. ID No. 3995, Seq. ID No. 3997, Seq. ID No. 4005, Seq. ID No. 4007, Seq.  
ID No. 4009, Seq. ID No. 4041, Seq. ID No. 4043, Seq. ID No. 4045, Seq. ID No.  
30 4069, Seq. ID No. 4077, Seq. ID No. 4097, Seq. ID No. 4113, Seq. ID No. 4123,  
Seq. ID No. 4131, Seq. ID No. 4133, Seq. ID No. 4135, Seq. ID No. 4139, Seq.  
ID No. 4151, Seq. ID No. 4153, Seq. ID No. 4155, Seq. ID No. 4181, Seq. ID No.  
4221, Seq. ID No. 4241, Seq. ID No. 4253, Seq. ID No. 4257, Seq. ID No. 4259,

Seq. ID No. 4261, Seq. ID No. 4263, Seq. ID No. 4265, Seq. ID No. 4269, Seq.  
ID No. 4275, Seq. ID No. 4277, Seq. ID No. 4279, Seq. ID No. 4281, Seq. ID No.  
4285, Seq. ID No. 4287, Seq. ID No. 4297, Seq. ID No. 4305, Seq. ID No. 4307,  
Seq. ID No. 4363, Seq. ID No. 4365, Seq. ID No. 4371, Seq. ID No. 4373, Seq.  
5 ID No. 4395, Seq. ID No. 4399, Seq. ID No. 4403, Seq. ID No. 4425, Seq. ID No.  
4437, Seq. ID No. 4439, Seq. ID No. 4441, Seq. ID No. 4453, Seq. ID No. 4455,  
Seq. ID No. 4513, Seq. ID No. 4515, Seq. ID No. 4551, Seq. ID No. 4561, Seq.  
ID No. 4573, Seq. ID No. 4575, Seq. ID No. 4587, Seq. ID No. 4589, Seq. ID No.  
4591, Seq. ID No. 4593, Seq. ID No. 4595, Seq. ID No. 4617, Seq. ID No. 4619,  
10 Seq. ID No. 4621, Seq. ID No. 4625, Seq. ID No. 4627, Seq. ID No. 4633, Seq.  
ID No. 4635, Seq. ID No. 4637, Seq. ID No. 4639, Seq. ID No. 4659, Seq. ID No.  
4681, Seq. ID No. 4687, Seq. ID No. 4695, Seq. ID No. 4699, Seq. ID No. 4701,  
Seq. ID No. 4721, Seq. ID No. 4735, Seq. ID No. 4737, Seq. ID No. 4741, Seq.  
ID No. 4783, Seq. ID No. 4789, Seq. ID No. 4805, Seq. ID No. 4811, Seq. ID No.  
15 4817, Seq. ID No. 4819, Seq. ID No. 4821, Seq. ID No. 4823, Seq. ID No. 4835,  
Seq. ID No. 4853, Seq. ID No. 4885, Seq. ID No. 4913, Seq. ID No. 4923, Seq.  
ID No. 4949, Seq. ID No. 4951, Seq. ID No. 4975, Seq. ID No. 4981, Seq. ID No.  
4983, Seq. ID No. 4987, Seq. ID No. 4993, Seq. ID No. 4999, Seq. ID No. 5001,  
Seq. ID No. 5011, Seq. ID No. 5013, Seq. ID No. 5023, Seq. ID No. 5031, Seq.  
20 ID No. 5033, Seq. ID No. 5035, Seq. ID No. 5037, Seq. ID No. 5041, Seq. ID No.  
5043, Seq. ID No. 5053, Seq. ID No. 5061, Seq. ID No. 5063, Seq. ID No. 5085,  
Seq. ID No. 5093, Seq. ID No. 5151, Seq. ID No. 5153, Seq. ID No. 5159, Seq.  
ID No. 5161, Seq. ID No. 5167, Seq. ID No. 5173, Seq. ID No. 5175, Seq. ID No.  
5177, Seq. ID No. 5189, Seq. ID No. 5191, Seq. ID No. 5193, Seq. ID No. 5197,  
25 Seq. ID No. 5199, Seq. ID No. 5221, Seq. ID No. 5223, Seq. ID No. 5225, Seq.  
ID No. 5227, Seq. ID No. 5237, Seq. ID No. 5267, Seq. ID No. 5269, Seq. ID No.  
5271, Seq. ID No. 5281, Seq. ID No. 5301, Seq. ID No. 5303, Seq. ID No. 5315,  
Seq. ID No. 5321, Seq. ID No. 5327, Seq. ID No. 5347, Seq. ID No. 5385, Seq.  
ID No. 5445, Seq. ID No. 5447, Seq. ID No. 5459, Seq. ID No. 5465, Seq. ID No.  
30 5467, Seq. ID No. 5479, Seq. ID No. 5481, Seq. ID No. 5485, Seq. ID No. 5487,  
Seq. ID No. 5515, Seq. ID No. 5517, Seq. ID No. 5533, Seq. ID No. 5543, Seq.  
ID No. 5545, Seq. ID No. 5549, Seq. ID No. 5569, Seq. ID No. 5577, Seq. ID No.  
5593, Seq. ID No. 5595, Seq. ID No. 5609, Seq. ID No. 5623, Seq. ID No. 5625,

Seq. ID No. 5639, Seq. ID No. 5641, Seq. ID No. 5643, Seq. ID No. 5649, Seq.  
ID No. 5659, Seq. ID No. 5661, Seq. ID No. 5663, Seq. ID No. 5667, Seq. ID No.  
5671, Seq. ID No. 5687, Seq. ID No. 5689, Seq. ID No. 5703, Seq. ID No. 5705,  
Seq. ID No. 5709, Seq. ID No. 5711, Seq. ID No. 5737, Seq. ID No. 5739, Seq.  
5 ID No. 5745, Seq. ID No. 5751, Seq. ID No. 5763, Seq. ID No. 5797, Seq. ID No.  
5811, Seq. ID No. 5813, Seq. ID No. 5815, Seq. ID No. 5827, Seq. ID No. 5829,  
Seq. ID No. 5843, Seq. ID No. 5845, Seq. ID No. 5873, Seq. ID No. 5879, Seq.  
ID No. 5883, Seq. ID No. 5885, Seq. ID No. 5887, Seq. ID No. 5889, Seq. ID No.  
5891, Seq. ID No. 5931, Seq. ID No. 5955, Seq. ID No. 5963, Seq. ID No. 5965,  
10 Seq. ID No. 5975, Seq. ID No. 5983, Seq. ID No. 5985, Seq. ID No. 5987, Seq.  
ID No. 5989, Seq. ID No. 6005, Seq. ID No. 6013, Seq. ID No. 6031, Seq. ID No.  
6035, Seq. ID No. 6045, Seq. ID No. 6059, Seq. ID No. 6061, Seq. ID No. 6063,  
Seq. ID No. 6073, Seq. ID No. 6081, Seq. ID No. 6091, Seq. ID No. 6093, Seq.  
ID No. 6127, Seq. ID No. 6159, Seq. ID No. 6197, Seq. ID No. 6199, Seq. ID No.  
15 6203, Seq. ID No. 6217, Seq. ID No. 6221, Seq. ID No. 6223, Seq. ID No. 6237,  
Seq. ID No. 6239, Seq. ID No. 6241, Seq. ID No. 6245, Seq. ID No. 6247, Seq.  
ID No. 6249, Seq. ID No. 6259, Seq. ID No. 6265, Seq. ID No. 6267, Seq. ID No.  
6273, Seq. ID No. 6283, Seq. ID No. 6285, Seq. ID No. 6323, Seq. ID No. 6325,  
Seq. ID No. 6327, Seq. ID No. 6361, Seq. ID No. 6363, Seq. ID No. 6377, Seq.  
20 ID No. 6381, Seq. ID No. 6401, Seq. ID No. 6403, Seq. ID No. 6419, Seq. ID No.  
6425, Seq. ID No. 6427, Seq. ID No. 6429, Seq. ID No. 6431, Seq. ID No. 6433,  
Seq. ID No. 6435, Seq. ID No. 6437, Seq. ID No. 6439, Seq. ID No. 6447, Seq.  
ID No. 6449, Seq. ID No. 6451, Seq. ID No. 6453, Seq. ID No. 6455, Seq. ID No.  
6457, Seq. ID No. 6465, Seq. ID No. 6467, Seq. ID No. 6469, Seq. ID No. 6471,  
25 Seq. ID No. 6473, Seq. ID No. 6475, Seq. ID No. 6477, Seq. ID No. 6479, Seq.  
ID No. 6481, Seq. ID No. 6483, Seq. ID No. 6485, Seq. ID No. 6487, Seq. ID No.  
6489, Seq. ID No. 6491, Seq. ID No. 6495, Seq. ID No. 6497, Seq. ID No. 6507,  
Seq. ID No. 6517, Seq. ID No. 6519, Seq. ID No. 6521, Seq. ID No. 6523, Seq.  
ID No. 6525, Seq. ID No. 6527, Seq. ID No. 6529, Seq. ID No. 6533, Seq. ID No.  
30 6539, Seq. ID No. 6541, Seq. ID No. 6543, Seq. ID No. 6555, Seq. ID No. 6557,  
Seq. ID No. 6561, Seq. ID No. 6563, Seq. ID No. 6565, Seq. ID No. 6567, Seq.  
ID No. 6569, Seq. ID No. 6571, Seq. ID No. 6573, Seq. ID No. 6581, Seq. ID No.

6583, Seq. ID No. 6631, Seq. ID No. 6635, Seq. ID No. 6637, Seq. ID No. 6639, Seq. ID No. 6643, Seq. ID No. 6645, Seq. ID No. 6647, and Seq. ID No. 6649.

27. The polynucleotide of claim 7, wherein the polypeptide encoded by the polynucleotide is identified by GLIMMER™ ORF finder program, and the polynucleotide is selected from one of Seq. ID No. 1, Seq. ID No. 5, Seq. ID No. 11, Seq. ID No. 13, Seq. ID No. 15, Seq. ID No. 17, Seq. ID No. 25, Seq. ID No. 27, Seq. ID No. 29, Seq. ID No. 35, Seq. ID No. 37, Seq. ID No. 41, Seq. ID No. 43, Seq. ID No. 47, Seq. ID No. 51, Seq. ID No. 53, Seq. ID No. 59, Seq. ID No. 63, Seq. ID No. 69, Seq. ID No. 73, Seq. ID No. 75, Seq. ID No. 81, Seq. ID No. 83, Seq. ID No. 89, Seq. ID No. 93, Seq. ID No. 97, Seq. ID No. 103, Seq. ID No. 111, Seq. ID No. 121, Seq. ID No. 125, Seq. ID No. 129, Seq. ID No. 135, Seq. ID No. 137, Seq. ID No. 145, Seq. ID No. 149, Seq. ID No. 157, Seq. ID No. 167, Seq. ID No. 173, Seq. ID No. 183, Seq. ID No. 187, Seq. ID No. 189, Seq. ID No. 191, Seq. ID No. 195, Seq. ID No. 197, Seq. ID No. 203, Seq. ID No. 207, Seq. ID No. 215, Seq. ID No. 219, Seq. ID No. 223, Seq. ID No. 225, Seq. ID No. 227, Seq. ID No. 231, Seq. ID No. 233, Seq. ID No. 239, Seq. ID No. 241, Seq. ID No. 247, Seq. ID No. 253, Seq. ID No. 261, Seq. ID No. 265, Seq. ID No. 269, Seq. ID No. 273, Seq. ID No. 275, Seq. ID No. 277, Seq. ID No. 283, Seq. ID No. 291, Seq. ID No. 293, Seq. ID No. 297, Seq. ID No. 301, Seq. ID No. 307, Seq. ID No. 309, Seq. ID No. 313, Seq. ID No. 317, Seq. ID No. 321, Seq. ID No. 325, Seq. ID No. 335, Seq. ID No. 343, Seq. ID No. 345, Seq. ID No. 353, Seq. ID No. 355, Seq. ID No. 361, Seq. ID No. 363, Seq. ID No. 367, Seq. ID No. 375, Seq. ID No. 379, Seq. ID No. 383, Seq. ID No. 389, Seq. ID No. 391, Seq. ID No. 397, Seq. ID No. 405, Seq. ID No. 411, Seq. ID No. 415, Seq. ID No. 417, Seq. ID No. 423, Seq. ID No. 425, Seq. ID No. 427, Seq. ID No. 429, Seq. ID No. 435, Seq. ID No. 437, Seq. ID No. 439, Seq. ID No. 441, Seq. ID No. 445, Seq. ID No. 447, Seq. ID No. 453, Seq. ID No. 461, Seq. ID No. 463, Seq. ID No. 471, Seq. ID No. 485, Seq. ID No. 501, Seq. ID No. 505, Seq. ID No. 511, Seq. ID No. 515, Seq. ID No. 517, Seq. ID No. 521, Seq. ID No. 523, Seq. ID No. 531, Seq. ID No. 533, Seq. ID No. 539, Seq. ID No. 541, Seq. ID No. 543, Seq. ID No. 551, Seq. ID No. 555, Seq. ID No. 561, Seq. ID No. 565, Seq. ID No. 569, Seq. ID No. 575, Seq. ID No. 579, Seq. ID No. 587, Seq. ID No. 593, Seq. ID No. 597, Seq. ID No. 603, Seq. ID No. 605, Seq. ID No. 609, Seq. ID No. 611, Seq. ID No. 613, Seq. ID No. 615,

Seq. ID No. 623, Seq. ID No. 627, Seq. ID No. 629, Seq. ID No. 631, Seq. ID No. 635, Seq. ID No. 637, Seq. ID No. 647, Seq. ID No. 649, Seq. ID No. 661, Seq. ID No. 669, Seq. ID No. 673, Seq. ID No. 675, Seq. ID No. 681, Seq. ID No. 683, Seq. ID No. 689, Seq. ID No. 701, Seq. ID No. 703, Seq. ID No. 709, Seq. ID No. 713, Seq. ID No. 729, Seq. ID No. 733, Seq. ID No. 735, Seq. ID No. 737, Seq. ID No. 741, Seq. ID No. 747, Seq. ID No. 751, Seq. ID No. 753, Seq. ID No. 759, Seq. ID No. 765, Seq. ID No. 767, Seq. ID No. 771, Seq. ID No. 781, Seq. ID No. 783, Seq. ID No. 787, Seq. ID No. 791, Seq. ID No. 795, Seq. ID No. 799, Seq. ID No. 807, Seq. ID No. 817, Seq. ID No. 819, Seq. ID No. 823, Seq. ID No. 827, Seq. ID No. 831, Seq. ID No. 835, Seq. ID No. 837, Seq. ID No. 839, Seq. ID No. 847, Seq. ID No. 851, Seq. ID No. 855, Seq. ID No. 859, Seq. ID No. 867, Seq. ID No. 871, Seq. ID No. 875, Seq. ID No. 881, Seq. ID No. 885, Seq. ID No. 889, Seq. ID No. 891, Seq. ID No. 895, Seq. ID No. 901, Seq. ID No. 907, Seq. ID No. 915, Seq. ID No. 919, Seq. ID No. 925, Seq. ID No. 929, Seq. ID No. 935, Seq. ID No. 939, Seq. ID No. 949, Seq. ID No. 951, Seq. ID No. 955, Seq. ID No. 961, Seq. ID No. 965, Seq. ID No. 967, Seq. ID No. 971, Seq. ID No. 985, Seq. ID No. 993, Seq. ID No. 997, Seq. ID No. 1003, Seq. ID No. 1005, Seq. ID No. 1009, Seq. ID No. 1017, Seq. ID No. 1023, Seq. ID No. 1039, Seq. ID No. 1041, Seq. ID No. 1043, Seq. ID No. 1051, Seq. ID No. 1053, Seq. ID No. 1057, Seq. ID No. 1061, Seq. ID No. 1065, Seq. ID No. 1067, Seq. ID No. 1069, Seq. ID No. 1073, Seq. ID No. 1075, Seq. ID No. 1083, Seq. ID No. 1087, Seq. ID No. 1091, Seq. ID No. 1093, Seq. ID No. 1097, Seq. ID No. 1099, Seq. ID No. 1103, Seq. ID No. 1109, Seq. ID No. 1115, Seq. ID No. 1117, Seq. ID No. 1123, Seq. ID No. 1129, Seq. ID No. 1133, Seq. ID No. 1137, Seq. ID No. 1143, Seq. ID No. 1147, Seq. ID No. 1149, Seq. ID No. 1155, Seq. ID No. 1157, Seq. ID No. 1159, Seq. ID No. 1163, Seq. ID No. 1171, Seq. ID No. 1179, Seq. ID No. 1181, Seq. ID No. 1187, Seq. ID No. 1193, Seq. ID No. 1199, Seq. ID No. 1205, Seq. ID No. 1211, Seq. ID No. 1217, Seq. ID No. 1221, Seq. ID No. 1223, Seq. ID No. 1225, Seq. ID No. 1231, Seq. ID No. 1233, Seq. ID No. 1237, Seq. ID No. 1241, Seq. ID No. 1253, Seq. ID No. 1257, Seq. ID No. 1263, Seq. ID No. 1271, Seq. ID No. 1281, Seq. ID No. 1317, Seq. ID No. 1323, Seq. ID No. 1331, Seq. ID No. 1335, Seq. ID No. 1339, Seq. ID No. 1345, Seq. ID No. 1347, Seq. ID No. 1361, Seq. ID No. 1369, Seq. ID No. 1377, Seq. ID No. 1379, Seq. ID No. 1387, Seq. ID No. 1393, Seq.

5 ID No. 1395, Seq. ID No. 1399, Seq. ID No. 1403, Seq. ID No. 1405, Seq. ID No.  
1411, Seq. ID No. 1413, Seq. ID No. 1415, Seq. ID No. 1419, Seq. ID No. 1425,  
Seq. ID No. 1427, Seq. ID No. 1429, Seq. ID No. 1431, Seq. ID No. 1433, Seq.  
ID No. 1437, Seq. ID No. 1443, Seq. ID No. 1449, Seq. ID No. 1451, Seq. ID No.  
1455, Seq. ID No. 1457, Seq. ID No. 1459, Seq. ID No. 1463, Seq. ID No. 1465,  
Seq. ID No. 1469, Seq. ID No. 1471, Seq. ID No. 1473, Seq. ID No. 1475, Seq.  
ID No. 1477, Seq. ID No. 1485, Seq. ID No. 1487, Seq. ID No. 1491, Seq. ID No.  
1493, Seq. ID No. 1495, Seq. ID No. 1497, Seq. ID No. 1501, Seq. ID No. 1505,  
Seq. ID No. 1507, Seq. ID No. 1509, Seq. ID No. 1517, Seq. ID No. 1525, Seq.  
10 ID No. 1527, Seq. ID No. 1531, Seq. ID No. 1539, Seq. ID No. 1541, Seq. ID No.  
1543, Seq. ID No. 1549, Seq. ID No. 1561, Seq. ID No. 1563, Seq. ID No. 1567,  
Seq. ID No. 1571, Seq. ID No. 1573, Seq. ID No. 1577, Seq. ID No. 1581, Seq.  
ID No. 1589, Seq. ID No. 1593, Seq. ID No. 1595, Seq. ID No. 1597, Seq. ID No.  
1603, Seq. ID No. 1607, Seq. ID No. 1611, Seq. ID No. 1613, Seq. ID No. 1619,  
15 Seq. ID No. 1623, Seq. ID No. 1627, Seq. ID No. 1631, Seq. ID No. 1637, Seq.  
ID No. 1639, Seq. ID No. 1641, Seq. ID No. 1647, Seq. ID No. 1653, Seq. ID No.  
1657, Seq. ID No. 1665, Seq. ID No. 1669, Seq. ID No. 1681, Seq. ID No. 1685,  
Seq. ID No. 1689, Seq. ID No. 1691, Seq. ID No. 1697, Seq. ID No. 1699, Seq.  
ID No. 1707, Seq. ID No. 1711, Seq. ID No. 1713, Seq. ID No. 1719, Seq. ID No.  
20 1723, Seq. ID No. 1729, Seq. ID No. 1735, Seq. ID No. 1737, Seq. ID No. 1741,  
Seq. ID No. 1747, Seq. ID No. 1751, Seq. ID No. 1757, Seq. ID No. 1759, Seq.  
ID No. 1761, Seq. ID No. 1771, Seq. ID No. 1777, Seq. ID No. 1785, Seq. ID No.  
1789, Seq. ID No. 1791, Seq. ID No. 1797, Seq. ID No. 1801, Seq. ID No. 1803,  
Seq. ID No. 1805, Seq. ID No. 1811, Seq. ID No. 1817, Seq. ID No. 1819, Seq.  
25 ID No. 1821, Seq. ID No. 1825, Seq. ID No. 1829, Seq. ID No. 1837, Seq. ID No.  
1843, Seq. ID No. 1845, Seq. ID No. 1847, Seq. ID No. 1849, Seq. ID No. 1851,  
Seq. ID No. 1855, Seq. ID No. 1859, Seq. ID No. 1863, Seq. ID No. 1865, Seq.  
ID No. 1867, Seq. ID No. 1871, Seq. ID No. 1873, Seq. ID No. 1877, Seq. ID No.  
1885, Seq. ID No. 1887, Seq. ID No. 1889, Seq. ID No. 1895, Seq. ID No. 1897,  
30 Seq. ID No. 1899, Seq. ID No. 1903, Seq. ID No. 1905, Seq. ID No. 1913, Seq.  
ID No. 1919, Seq. ID No. 1923, Seq. ID No. 1925, Seq. ID No. 1931, Seq. ID No.  
1935, Seq. ID No. 1937, Seq. ID No. 1943, Seq. ID No. 1945, Seq. ID No. 1949,  
Seq. ID No. 1953, Seq. ID No. 1957, Seq. ID No. 1959, Seq. ID No. 1961, Seq.

5 ID No. 1965, Seq. ID No. 1967, Seq. ID No. 1971, Seq. ID No. 1975, Seq. ID No. 1979, Seq. ID No. 1983, Seq. ID No. 1987, Seq. ID No. 1989, Seq. ID No. 1991, Seq. ID No. 1999, Seq. ID No. 2001, Seq. ID No. 2003, Seq. ID No. 2009, Seq. ID No. 2015, Seq. ID No. 2019, Seq. ID No. 2021, Seq. ID No. 2031, Seq. ID No. 2035, Seq. ID No. 2037, Seq. ID No. 2045, Seq. ID No. 2047, Seq. ID No. 2055, Seq. ID No. 2059, Seq. ID No. 2065, Seq. ID No. 2067, Seq. ID No. 2069, Seq. ID No. 2071, Seq. ID No. 2073, Seq. ID No. 2079, Seq. ID No. 2091, Seq. ID No. 2093, Seq. ID No. 2097, Seq. ID No. 2099, Seq. ID No. 2103, Seq. ID No. 2115, Seq. ID No. 2119, Seq. ID No. 2127, Seq. ID No. 2135, Seq. ID No. 2137, Seq. ID No. 2141, Seq. ID No. 2143, Seq. ID No. 2147, Seq. ID No. 2153, Seq. ID No. 2159, Seq. ID No. 2161, Seq. ID No. 2165, Seq. ID No. 2169, Seq. ID No. 2179, Seq. ID No. 2183, Seq. ID No. 2185, Seq. ID No. 2189, Seq. ID No. 2191, Seq. ID No. 2193, Seq. ID No. 2195, Seq. ID No. 2199, Seq. ID No. 2207, Seq. ID No. 2217, Seq. ID No. 2219, Seq. ID No. 2221, Seq. ID No. 2223, Seq. ID No. 2227, Seq. ID No. 2229, Seq. ID No. 2231, Seq. ID No. 2233, Seq. ID No. 2241, Seq. ID No. 2245, Seq. ID No. 2251, Seq. ID No. 2253, Seq. ID No. 2257, Seq. ID No. 2259, Seq. ID No. 2263, Seq. ID No. 2267, Seq. ID No. 2269, Seq. ID No. 2275, Seq. ID No. 2281, Seq. ID No. 2287, Seq. ID No. 2297, Seq. ID No. 2299, Seq. ID No. 2301, Seq. ID No. 2315, Seq. ID No. 2329, Seq. ID No. 2333, Seq. ID No. 2335, Seq. ID No. 2339, Seq. ID No. 2343, Seq. ID No. 2345, Seq. ID No. 2349, Seq. ID No. 2351, Seq. ID No. 2357, Seq. ID No. 2359, Seq. ID No. 2363, Seq. ID No. 2365, Seq. ID No. 2369, Seq. ID No. 2373, Seq. ID No. 2381, Seq. ID No. 2391, Seq. ID No. 2399, Seq. ID No. 2401, Seq. ID No. 2405, Seq. ID No. 2409, Seq. ID No. 2415, Seq. ID No. 2417, Seq. ID No. 2421, Seq. ID No. 2423, Seq. ID No. 2427, Seq. ID No. 2429, Seq. ID No. 2431, Seq. ID No. 2435, Seq. ID No. 2437, Seq. ID No. 2439, Seq. ID No. 2443, Seq. ID No. 2445, Seq. ID No. 2449, Seq. ID No. 2451, Seq. ID No. 2453, Seq. ID No. 2457, Seq. ID No. 2463, Seq. ID No. 2465, Seq. ID No. 2469, Seq. ID No. 2471, Seq. ID No. 2475, Seq. ID No. 2477, Seq. ID No. 2483, Seq. ID No. 2485, Seq. ID No. 2491, Seq. ID No. 2495, Seq. ID No. 2505, Seq. ID No. 2507, Seq. ID No. 2513, Seq. ID No. 2519, Seq. ID No. 2525, Seq. ID No. 2529, Seq. ID No. 2535, Seq. ID No. 2537, Seq. ID No. 2539, Seq. ID No. 2549, Seq. ID No. 2553, Seq. ID No. 2563, Seq. ID No. 2567, Seq. ID No. 2575, Seq. ID No. 2577, Seq. ID No. 2581, Seq. ID No. 2589, Seq.



5 ID No. 2593, Seq. ID No. 2595, Seq. ID No. 2599, Seq. ID No. 2603, Seq. ID No. 2607, Seq. ID No. 2609, Seq. ID No. 2613, Seq. ID No. 2617, Seq. ID No. 2619, Seq. ID No. 2623, Seq. ID No. 2625, Seq. ID No. 2631, Seq. ID No. 2633, Seq. ID No. 2639, Seq. ID No. 2641, Seq. ID No. 2645, Seq. ID No. 2649, Seq. ID No. 2651, Seq. ID No. 2655, Seq. ID No. 2659, Seq. ID No. 2663, Seq. ID No. 2667, Seq. ID No. 2669, Seq. ID No. 2671, Seq. ID No. 2677, Seq. ID No. 2687, Seq. ID No. 2689, Seq. ID No. 2693, Seq. ID No. 2699, Seq. ID No. 2703, Seq. ID No. 2709, Seq. ID No. 2711, Seq. ID No. 2715, Seq. ID No. 2719, Seq. ID No. 2725, Seq. ID No. 2727, Seq. ID No. 2737, Seq. ID No. 2743, Seq. ID No. 2747, Seq. ID No. 2751, Seq. ID No. 2753, Seq. ID No. 2759, Seq. ID No. 2763, Seq. ID No. 2765, Seq. ID No. 2767, Seq. ID No. 2771, Seq. ID No. 2773, Seq. ID No. 2775, Seq. ID No. 2781, Seq. ID No. 2787, Seq. ID No. 2789, Seq. ID No. 2791, Seq. ID No. 2793, Seq. ID No. 2797, Seq. ID No. 2799, Seq. ID No. 2803, Seq. ID No. 2805, Seq. ID No. 2811, Seq. ID No. 2815, Seq. ID No. 2823, Seq. ID No. 2827, Seq. ID No. 2843, Seq. ID No. 2847, Seq. ID No. 2863, Seq. ID No. 2867, Seq. ID No. 2869, Seq. ID No. 2871, Seq. ID No. 2877, Seq. ID No. 2881, Seq. ID No. 2891, Seq. ID No. 2899, Seq. ID No. 2901, Seq. ID No. 2903, Seq. ID No. 2907, Seq. ID No. 2911, Seq. ID No. 2913, Seq. ID No. 2917, Seq. ID No. 2919, Seq. ID No. 2921, Seq. ID No. 2923, Seq. ID No. 2927, Seq. ID No. 2933, Seq. ID No. 2945, Seq. ID No. 2953, Seq. ID No. 2957, Seq. ID No. 2963, Seq. ID No. 2971, Seq. ID No. 2973, Seq. ID No. 2977, Seq. ID No. 2979, Seq. ID No. 2983, Seq. ID No. 2985, Seq. ID No. 2991, Seq. ID No. 2993, Seq. ID No. 2999, Seq. ID No. 3001, Seq. ID No. 3005, Seq. ID No. 3011, Seq. ID No. 3019, Seq. ID No. 3027, Seq. ID No. 3033, Seq. ID No. 3035, Seq. ID No. 3039, Seq. ID No. 3043, Seq. ID No. 3045, Seq. ID No. 3049, Seq. ID No. 3055, Seq. ID No. 3059, Seq. ID No. 3061, Seq. ID No. 3067, Seq. ID No. 3069, Seq. ID No. 3081, Seq. ID No. 3089, Seq. ID No. 3091, Seq. ID No. 3093, Seq. ID No. 3097, Seq. ID No. 3103, Seq. ID No. 3107, Seq. ID No. 3111, Seq. ID No. 3117, Seq. ID No. 3125, Seq. ID No. 3133, Seq. ID No. 3135, Seq. ID No. 3137, Seq. ID No. 3141, Seq. ID No. 3143, Seq. ID No. 3149, Seq. ID No. 3155, Seq. ID No. 3157, Seq. ID No. 3159, Seq. ID No. 3161, Seq. ID No. 3165, Seq. ID No. 3171, Seq. ID No. 3177, Seq. ID No. 3179, Seq. ID No. 3183, Seq. ID No. 3185, Seq. ID No. 3189, Seq. ID No. 3191, Seq. ID No. 3197, Seq. ID No. 3203, Seq. ID No. 3205, Seq. ID No. 3211, Seq.

5 ID No. 3217, Seq. ID No. 3221, Seq. ID No. 3227, Seq. ID No. 3229, Seq. ID No.  
3233, Seq. ID No. 3235, Seq. ID No. 3239, Seq. ID No. 3249, Seq. ID No. 3251,  
Seq. ID No. 3253, Seq. ID No. 3257, Seq. ID No. 3259, Seq. ID No. 3263, Seq.  
ID No. 3265, Seq. ID No. 3271, Seq. ID No. 3273, Seq. ID No. 3277, Seq. ID No.  
10 3283, Seq. ID No. 3285, Seq. ID No. 3287, Seq. ID No. 3289, Seq. ID No. 3293,  
Seq. ID No. 3295, Seq. ID No. 3299, Seq. ID No. 3303, Seq. ID No. 3307, Seq.  
ID No. 3313, Seq. ID No. 3315, Seq. ID No. 3319, Seq. ID No. 3323, Seq. ID No.  
3329, Seq. ID No. 3335, Seq. ID No. 3337, Seq. ID No. 3347, Seq. ID No. 3355,  
Seq. ID No. 3359, Seq. ID No. 3363, Seq. ID No. 3367, Seq. ID No. 3377, Seq.  
15 ID No. 3379, Seq. ID No. 3383, Seq. ID No. 3387, Seq. ID No. 3399, Seq. ID No.  
3401, Seq. ID No. 3403, Seq. ID No. 3409, Seq. ID No. 3413, Seq. ID No. 3415,  
Seq. ID No. 3417, Seq. ID No. 3425, Seq. ID No. 3427, Seq. ID No. 3431, Seq.  
ID No. 3435, Seq. ID No. 3437, Seq. ID No. 3439, Seq. ID No. 3447, Seq. ID No.  
3459, Seq. ID No. 3461, Seq. ID No. 3467, Seq. ID No. 3469, Seq. ID No. 3471,  
20 Seq. ID No. 3473, Seq. ID No. 3475, Seq. ID No. 3479, Seq. ID No. 3483, Seq.  
ID No. 3485, Seq. ID No. 3487, Seq. ID No. 3495, Seq. ID No. 3501, Seq. ID No.  
3505, Seq. ID No. 3507, Seq. ID No. 3509, Seq. ID No. 3511, Seq. ID No. 3519,  
Seq. ID No. 3521, Seq. ID No. 3525, Seq. ID No. 3529, Seq. ID No. 3533, Seq.  
ID No. 3537, Seq. ID No. 3543, Seq. ID No. 3549, Seq. ID No. 3553, Seq. ID No.  
25 3561, Seq. ID No. 3565, Seq. ID No. 3569, Seq. ID No. 3575, Seq. ID No. 3579,  
Seq. ID No. 3583, Seq. ID No. 3585, Seq. ID No. 3589, Seq. ID No. 3599, Seq.  
ID No. 3605, Seq. ID No. 3607, Seq. ID No. 3609, Seq. ID No. 3611, Seq. ID No.  
3615, Seq. ID No. 3619, Seq. ID No. 3629, Seq. ID No. 3635, Seq. ID No. 3639,  
Seq. ID No. 3641, Seq. ID No. 3643, Seq. ID No. 3645, Seq. ID No. 3651, Seq.  
30 ID No. 3653, Seq. ID No. 3659, Seq. ID No. 3663, Seq. ID No. 3665, Seq. ID No.  
3667, Seq. ID No. 3669, Seq. ID No. 3675, Seq. ID No. 3681, Seq. ID No. 3689,  
Seq. ID No. 3695, Seq. ID No. 3699, Seq. ID No. 3709, Seq. ID No. 3715, Seq.  
ID No. 3721, Seq. ID No. 3727, Seq. ID No. 3729, Seq. ID No. 3733, Seq. ID No.  
3735, Seq. ID No. 3739, Seq. ID No. 3741, Seq. ID No. 3747, Seq. ID No. 3751,  
Seq. ID No. 3759, Seq. ID No. 3771, Seq. ID No. 3775, Seq. ID No. 3779, Seq.  
ID No. 3783, Seq. ID No. 3791, Seq. ID No. 3797, Seq. ID No. 3803, Seq. ID No.  
3805, Seq. ID No. 3811, Seq. ID No. 3813, Seq. ID No. 3819, Seq. ID No. 3823,  
Seq. ID No. 3825, Seq. ID No. 3833, Seq. ID No. 3835, Seq. ID No. 3843, Seq.

5 ID No. 3847, Seq. ID No. 3855, Seq. ID No. 3857, Seq. ID No. 3863, Seq. ID No.  
3867, Seq. ID No. 3873, Seq. ID No. 3877, Seq. ID No. 3881, Seq. ID No. 3883,  
Seq. ID No. 3885, Seq. ID No. 3893, Seq. ID No. 3897, Seq. ID No. 3901, Seq.  
ID No. 3907, Seq. ID No. 3913, Seq. ID No. 3915, Seq. ID No. 3917, Seq. ID No.  
10 3919, Seq. ID No. 3925, Seq. ID No. 3929, Seq. ID No. 3933, Seq. ID No. 3935,  
Seq. ID No. 3937, Seq. ID No. 3941, Seq. ID No. 3943, Seq. ID No. 3945, Seq.  
ID No. 3949, Seq. ID No. 3951, Seq. ID No. 3955, Seq. ID No. 3957, Seq. ID No.  
3971, Seq. ID No. 3975, Seq. ID No. 3983, Seq. ID No. 3985, Seq. ID No. 3987,  
Seq. ID No. 3991, Seq. ID No. 4003, Seq. ID No. 4009, Seq. ID No. 4013, Seq.  
15 ID No. 4015, Seq. ID No. 4017, Seq. ID No. 4021, Seq. ID No. 4023, Seq. ID No.  
4029, Seq. ID No. 4031, Seq. ID No. 4035, Seq. ID No. 4037, Seq. ID No. 4039,  
Seq. ID No. 4049, Seq. ID No. 4055, Seq. ID No. 4057, Seq. ID No. 4061, Seq.  
ID No. 4063, Seq. ID No. 4067, Seq. ID No. 4069, Seq. ID No. 4075, Seq. ID No.  
4077, Seq. ID No. 4079, Seq. ID No. 4087, Seq. ID No. 4089, Seq. ID No. 4095,  
20 Seq. ID No. 4097, Seq. ID No. 4099, Seq. ID No. 4105, Seq. ID No. 4111, Seq.  
ID No. 4117, Seq. ID No. 4121, Seq. ID No. 4123, Seq. ID No. 4127, Seq. ID No.  
4129, Seq. ID No. 4133, Seq. ID No. 4137, Seq. ID No. 4145, Seq. ID No. 4149,  
Seq. ID No. 4157, Seq. ID No. 4161, Seq. ID No. 4163, Seq. ID No. 4167, Seq.  
ID No. 4173, Seq. ID No. 4179, Seq. ID No. 4185, Seq. ID No. 4191, Seq. ID No.  
25 4193, Seq. ID No. 4195, Seq. ID No. 4197, Seq. ID No. 4199, Seq. ID No. 4201,  
Seq. ID No. 4203, Seq. ID No. 4205, Seq. ID No. 4211, Seq. ID No. 4215, Seq.  
ID No. 4217, Seq. ID No. 4219, Seq. ID No. 4235, Seq. ID No. 4237, Seq. ID No.  
4239, Seq. ID No. 4243, Seq. ID No. 4251, Seq. ID No. 4255, Seq. ID No. 4263,  
Seq. ID No. 4267, Seq. ID No. 4271, Seq. ID No. 4273, Seq. ID No. 4279, Seq.  
30 ID No. 4281, Seq. ID No. 4283, Seq. ID No. 4291, Seq. ID No. 4295, Seq. ID No.  
4299, Seq. ID No. 4301, Seq. ID No. 4303, Seq. ID No. 4307, Seq. ID No. 4309,  
Seq. ID No. 4313, Seq. ID No. 4317, Seq. ID No. 4323, Seq. ID No. 4325, Seq.  
ID No. 4329, Seq. ID No. 4331, Seq. ID No. 4333, Seq. ID No. 4339, Seq. ID No.  
4343, Seq. ID No. 4347, Seq. ID No. 4353, Seq. ID No. 4355, Seq. ID No. 4357,  
Seq. ID No. 4365, Seq. ID No. 4369, Seq. ID No. 4373, Seq. ID No. 4375, Seq.  
ID No. 4377, Seq. ID No. 4379, Seq. ID No. 4381, Seq. ID No. 4383, Seq. ID No.  
4391, Seq. ID No. 4393, Seq. ID No. 4397, Seq. ID No. 4401, Seq. ID No. 4411,  
Seq. ID No. 4417, Seq. ID No. 4423, Seq. ID No. 4431, Seq. ID No. 4433, Seq.

5 ID No. 4435, Seq. ID No. 4443, Seq. ID No. 4447, Seq. ID No. 4451, Seq. ID No. 4459, Seq. ID No. 4461, Seq. ID No. 4467, Seq. ID No. 4471, Seq. ID No. 4475, Seq. ID No. 4479, Seq. ID No. 4481, Seq. ID No. 4487, Seq. ID No. 4491, Seq. ID No. 4501, Seq. ID No. 4505, Seq. ID No. 4511, Seq. ID No. 4523, Seq. ID No. 4531, Seq. ID No. 4533, Seq. ID No. 4537, Seq. ID No. 4539, Seq. ID No. 4541, Seq. ID No. 4543, Seq. ID No. 4547, Seq. ID No. 4549, Seq. ID No. 4559, Seq. ID No. 4565, Seq. ID No. 4567, Seq. ID No. 4571, Seq. ID No. 4575, Seq. ID No. 4577, Seq. ID No. 4581, Seq. ID No. 4585, Seq. ID No. 4591, Seq. ID No. 4595, Seq. ID No. 4597, Seq. ID No. 4603, Seq. ID No. 4607, Seq. ID No. 4609, Seq. ID No. 4611, Seq. ID No. 4615, Seq. ID No. 4623, Seq. ID No. 4627, Seq. ID No. 4631, Seq. ID No. 4635, Seq. ID No. 4637, Seq. ID No. 4643, Seq. ID No. 4649, Seq. ID No. 4651, Seq. ID No. 4653, Seq. ID No. 4657, Seq. ID No. 4661, Seq. ID No. 4663, Seq. ID No. 4669, Seq. ID No. 4671, Seq. ID No. 4673, Seq. ID No. 4679, Seq. ID No. 4685, Seq. ID No. 4693, Seq. ID No. 4697, Seq. ID No. 4703, Seq. ID No. 4705, Seq. ID No. 4713, Seq. ID No. 4717, Seq. ID No. 4719, Seq. ID No. 4725, Seq. ID No. 4729, Seq. ID No. 4731, Seq. ID No. 4733, Seq. ID No. 4739, Seq. ID No. 4743, Seq. ID No. 4745, Seq. ID No. 4747, Seq. ID No. 4749, Seq. ID No. 4751, Seq. ID No. 4757, Seq. ID No. 4765, Seq. ID No. 4769, Seq. ID No. 4777, Seq. ID No. 4779, Seq. ID No. 4781, Seq. ID No. 4787, Seq. ID No. 4789, Seq. ID No. 4791, Seq. ID No. 4797, Seq. ID No. 4803, Seq. ID No. 4807, Seq. ID No. 4809, Seq. ID No. 4811, Seq. ID No. 4813, Seq. ID No. 4815, Seq. ID No. 4821, Seq. ID No. 4823, Seq. ID No. 4825, Seq. ID No. 4827, Seq. ID No. 4833, Seq. ID No. 4835, Seq. ID No. 4837, Seq. ID No. 4843, Seq. ID No. 4845, Seq. ID No. 4847, Seq. ID No. 4849, Seq. ID No. 4859, Seq. ID No. 4861, Seq. ID No. 4865, Seq. ID No. 4867, Seq. ID No. 4875, Seq. ID No. 4877, Seq. ID No. 4879, Seq. ID No. 4881, Seq. ID No. 4883, Seq. ID No. 4885, Seq. ID No. 4887, Seq. ID No. 4893, Seq. ID No. 4899, Seq. ID No. 4901, Seq. ID No. 4903, Seq. ID No. 4905, Seq. ID No. 4907, Seq. ID No. 4911, Seq. ID No. 4915, Seq. ID No. 4917, Seq. ID No. 4919, Seq. ID No. 4921, Seq. ID No. 4927, Seq. ID No. 4931, Seq. ID No. 4935, Seq. ID No. 4939, Seq. ID No. 4941, Seq. ID No. 4943, Seq. ID No. 4945, Seq. ID No. 4947, Seq. ID No. 4953, Seq. ID No. 4957, Seq. ID No. 4959, Seq. ID No. 4963, Seq. ID No. 4965, Seq. ID No. 4969, Seq. ID No. 4971, Seq. ID No. 4973, Seq. ID No. 4979, Seq. ID No. 4985, Seq. ID No. 4989, Seq.

5 ID No. 4991, Seq. ID No. 4995, Seq. ID No. 4997, Seq. ID No. 5001, Seq. ID No. 5007, Seq. ID No. 5009, Seq. ID No. 5017, Seq. ID No. 5021, Seq. ID No. 5027, Seq. ID No. 5029, Seq. ID No. 5039, Seq. ID No. 5047, Seq. ID No. 5051, Seq. ID No. 5053, Seq. ID No. 5055, Seq. ID No. 5059, Seq. ID No. 5061, Seq. ID No. 5069, Seq. ID No. 5077, Seq. ID No. 5079, Seq. ID No. 5081, Seq. ID No. 5083, Seq. ID No. 5087, Seq. ID No. 5091, Seq. ID No. 5093, Seq. ID No. 5097, Seq. ID No. 5103, Seq. ID No. 5105, Seq. ID No. 5109, Seq. ID No. 5111, Seq. ID No. 5113, Seq. ID No. 5115, Seq. ID No. 5117, Seq. ID No. 5127, Seq. ID No. 5141, Seq. ID No. 5145, Seq. ID No. 5149, Seq. ID No. 5153, Seq. ID No. 5157, Seq. ID No. 5165, Seq. ID No. 5169, Seq. ID No. 5171, Seq. ID No. 5177, Seq. ID No. 5183, Seq. ID No. 5185, Seq. ID No. 5187, Seq. ID No. 5193, Seq. ID No. 5195, Seq. ID No. 5201, Seq. ID No. 5203, Seq. ID No. 5205, Seq. ID No. 5209, Seq. ID No. 5211, Seq. ID No. 5215, Seq. ID No. 5219, Seq. ID No. 5227, Seq. ID No. 5231, Seq. ID No. 5235, Seq. ID No. 5237, Seq. ID No. 5239, Seq. ID No. 5243, Seq. ID No. 5245, Seq. ID No. 5247, Seq. ID No. 5253, Seq. ID No. 5255, Seq. ID No. 5257, Seq. ID No. 5261, Seq. ID No. 5263, Seq. ID No. 5271, Seq. ID No. 5275, Seq. ID No. 5283, Seq. ID No. 5291, Seq. ID No. 5299, Seq. ID No. 5305, Seq. ID No. 5309, Seq. ID No. 5311, Seq. ID No. 5313, Seq. ID No. 5319, Seq. ID No. 5323, Seq. ID No. 5325, Seq. ID No. 5335, Seq. ID No. 5337, Seq. ID No. 5341, Seq. ID No. 5345, Seq. ID No. 5351, Seq. ID No. 5355, Seq. ID No. 5363, Seq. ID No. 5365, Seq. ID No. 5367, Seq. ID No. 5371, Seq. ID No. 5373, Seq. ID No. 5381, Seq. ID No. 5383, Seq. ID No. 5387, Seq. ID No. 5389, Seq. ID No. 5391, Seq. ID No. 5393, Seq. ID No. 5395, Seq. ID No. 5397, Seq. ID No. 5399, Seq. ID No. 5401, Seq. ID No. 5403, Seq. ID No. 5409, Seq. ID No. 5411, Seq. ID No. 5415, Seq. ID No. 5417, Seq. ID No. 5419, Seq. ID No. 5421, Seq. ID No. 5423, Seq. ID No. 5427, Seq. ID No. 5431, Seq. ID No. 5433, Seq. ID No. 5439, Seq. ID No. 5441, Seq. ID No. 5443, Seq. ID No. 5447, Seq. ID No. 5449, Seq. ID No. 5451, Seq. ID No. 5453, Seq. ID No. 5455, Seq. ID No. 5457, Seq. ID No. 5473, Seq. ID No. 5477, Seq. ID No. 5483, Seq. ID No. 5487, Seq. ID No. 5491, Seq. ID No. 5495, Seq. ID No. 5499, Seq. ID No. 5503, Seq. ID No. 5507, Seq. ID No. 5509, Seq. ID No. 5513, Seq. ID No. 5527, Seq. ID No. 5531, Seq. ID No. 5537, Seq. ID No. 5539, Seq. ID No. 5541, Seq. ID No. 5547, Seq. ID No. 5553, Seq. ID No. 5557, Seq. ID No. 5559, Seq. ID No. 5563, Seq. ID No. 5567, Seq.

5 ID No. 5571, Seq. ID No. 5575, Seq. ID No. 5581, Seq. ID No. 5585, Seq. ID No.  
5591, Seq. ID No. 5599, Seq. ID No. 5601, Seq. ID No. 5605, Seq. ID No. 5615,  
Seq. ID No. 5621, Seq. ID No. 5629, Seq. ID No. 5631, Seq. ID No. 5637, Seq.  
ID No. 5647, Seq. ID No. 5651, Seq. ID No. 5655, Seq. ID No. 5657, Seq. ID No.  
5661, Seq. ID No. 5665, Seq. ID No. 5669, Seq. ID No. 5671, Seq. ID No. 5673,  
Seq. ID No. 5679, Seq. ID No. 5685, Seq. ID No. 5693, Seq. ID No. 5697, Seq.  
ID No. 5699, Seq. ID No. 5701, Seq. ID No. 5707, Seq. ID No. 5715, Seq. ID No.  
5717, Seq. ID No. 5723, Seq. ID No. 5727, Seq. ID No. 5735, Seq. ID No. 5739,  
Seq. ID No. 5749, Seq. ID No. 5751, Seq. ID No. 5755, Seq. ID No. 5761, Seq.  
10 ID No. 5771, Seq. ID No. 5775, Seq. ID No. 5777, Seq. ID No. 5779, Seq. ID No.  
5783, Seq. ID No. 5789, Seq. ID No. 5795, Seq. ID No. 5801, Seq. ID No. 5803,  
Seq. ID No. 5809, Seq. ID No. 5815, Seq. ID No. 5819, Seq. ID No. 5825, Seq.  
ID No. 5833, Seq. ID No. 5835, Seq. ID No. 5841, Seq. ID No. 5845, Seq. ID No.  
5847, Seq. ID No. 5849, Seq. ID No. 5851, Seq. ID No. 5853, Seq. ID No. 5855,  
15 Seq. ID No. 5859, Seq. ID No. 5865, Seq. ID No. 5871, Seq. ID No. 5875, Seq.  
ID No. 5877, Seq. ID No. 5881, Seq. ID No. 5887, Seq. ID No. 5891, Seq. ID No.  
5895, Seq. ID No. 5897, Seq. ID No. 5901, Seq. ID No. 5903, Seq. ID No. 5911,  
Seq. ID No. 5913, Seq. ID No. 5915, Seq. ID No. 5917, Seq. ID No. 5919, Seq.  
ID No. 5929, Seq. ID No. 5931, Seq. ID No. 5933, Seq. ID No. 5937, Seq. ID No.  
20 5941, Seq. ID No. 5943, Seq. ID No. 5947, Seq. ID No. 5951, Seq. ID No. 5953,  
Seq. ID No. 5955, Seq. ID No. 5957, Seq. ID No. 5961, Seq. ID No. 5969, Seq.  
ID No. 5973, Seq. ID No. 5979, Seq. ID No. 5981, Seq. ID No. 5985, Seq. ID No.  
5989, Seq. ID No. 5993, Seq. ID No. 6001, Seq. ID No. 6003, Seq. ID No. 6011,  
Seq. ID No. 6015, Seq. ID No. 6017, Seq. ID No. 6021, Seq. ID No. 6027, Seq.  
25 ID No. 6029, Seq. ID No. 6033, Seq. ID No. 6035, Seq. ID No. 6041, Seq. ID No.  
6043, Seq. ID No. 6053, Seq. ID No. 6057, Seq. ID No. 6065, Seq. ID No. 6071,  
Seq. ID No. 6079, Seq. ID No. 6085, Seq. ID No. 6089, Seq. ID No. 6095, Seq.  
ID No. 6097, Seq. ID No. 6101, Seq. ID No. 6103, Seq. ID No. 6111, Seq. ID No.  
6113, Seq. ID No. 6117, Seq. ID No. 6123, Seq. ID No. 6125, Seq. ID No. 6129,  
30 Seq. ID No. 6131, Seq. ID No. 6133, Seq. ID No. 6141, Seq. ID No. 6145, Seq.  
ID No. 6149, Seq. ID No. 6157, Seq. ID No. 6165, Seq. ID No. 6169, Seq. ID No.  
6171, Seq. ID No. 6175, Seq. ID No. 6177, Seq. ID No. 6181, Seq. ID No. 6187,  
Seq. ID No. 6195, Seq. ID No. 6201, Seq. ID No. 6209, Seq. ID No. 6213, Seq.

ID No. 6215, Seq. ID No. 6219, Seq. ID No. 6233, Seq. ID No. 6235, Seq. ID No. 6243, Seq. ID No. 6249, Seq. ID No. 6251, Seq. ID No. 6257, Seq. ID No. 6261, Seq. ID No. 6263, Seq. ID No. 6271, Seq. ID No. 6275, Seq. ID No. 6277, Seq. ID No. 6281, Seq. ID No. 6287, Seq. ID No. 6297, Seq. ID No. 6299, Seq. ID No. 6305, Seq. ID No. 6311, Seq. ID No. 6315, Seq. ID No. 6321, Seq. ID No. 6323, Seq. ID No. 6327, Seq. ID No. 6331, Seq. ID No. 6333, Seq. ID No. 6337, Seq. ID No. 6339, Seq. ID No. 6341, Seq. ID No. 6343, Seq. ID No. 6345, Seq. ID No. 6353, Seq. ID No. 6357, Seq. ID No. 6359, Seq. ID No. 6361, Seq. ID No. 6367, Seq. ID No. 6369, Seq. ID No. 6373, Seq. ID No. 6375, Seq. ID No. 6377, Seq. ID No. 6379, Seq. ID No. 6389, Seq. ID No. 6395, Seq. ID No. 6399, Seq. ID No. 6403, Seq. ID No. 6407, Seq. ID No. 6411, Seq. ID No. 6413, Seq. ID No. 6417, Seq. ID No. 6423, Seq. ID No. 6433, Seq. ID No. 6437, Seq. ID No. 6439, Seq. ID No. 6445, Seq. ID No. 6449, Seq. ID No. 6451, Seq. ID No. 6457, Seq. ID No. 6459, Seq. ID No. 6461, Seq. ID No. 6463, Seq. ID No. 6477, Seq. ID No. 6481, Seq. ID No. 6483, Seq. ID No. 6487, Seq. ID No. 6489, Seq. ID No. 6491, Seq. ID No. 6493, Seq. ID No. 6495, Seq. ID No. 6503, Seq. ID No. 6505, Seq. ID No. 6511, Seq. ID No. 6515, Seq. ID No. 6519, Seq. ID No. 6523, Seq. ID No. 6525, Seq. ID No. 6529, Seq. ID No. 6531, Seq. ID No. 6533, Seq. ID No. 6537, Seq. ID No. 6545, Seq. ID No. 6551, Seq. ID No. 6553, Seq. ID No. 6559, Seq. ID No. 6563, Seq. ID No. 6567, Seq. ID No. 6577, Seq. ID No. 6579, Seq. ID No. 6583, Seq. ID No. 6585, Seq. ID No. 6587, Seq. ID No. 6589, Seq. ID No. 6603, Seq. ID No. 6605, Seq. ID No. 6609, Seq. ID No. 6613, Seq. ID No. 6615, Seq. ID No. 6617, Seq. ID No. 6621, Seq. ID No. 6623, Seq. ID No. 6627, Seq. ID No. 6629, Seq. ID No. 6633, and Seq. ID No. 6639.

28. The polynucleotide of claim 7, wherein the polynucleotide encoded by the polynucleotide is identified by GeneMark™ ORF finder program, and the polynucleotide is selected from one of Seq. ID No. 1, Seq. ID No. 3, Seq. ID No. 11, Seq. ID No. 13, Seq. ID No. 15, Seq. ID No. 17, Seq. ID No. 25, Seq. ID No. 27, Seq. ID No. 29, Seq. ID No. 35, Seq. ID No. 37, Seq. ID No. 39, Seq. ID No. 41, Seq. ID No. 43, Seq. ID No. 45, Seq. ID No. 49, Seq. ID No. 53, Seq. ID No. 57, Seq. ID No. 61, Seq. ID No. 69, Seq. ID No. 71, Seq. ID No. 75, Seq. ID No. 81, Seq. ID No. 83, Seq. ID No. 89, Seq. ID No. 95, Seq. ID No. 101, Seq. ID No.

111, Seq. ID No. 119, Seq. ID No. 125, Seq. ID No. 129, Seq. ID No. 135, Seq.  
ID No. 137, Seq. ID No. 141, Seq. ID No. 147, Seq. ID No. 151, Seq. ID No. 155,  
Seq. ID No. 167, Seq. ID No. 171, Seq. ID No. 181, Seq. ID No. 185, Seq. ID No.  
187, Seq. ID No. 189, Seq. ID No. 191, Seq. ID No. 195, Seq. ID No. 199, Seq.  
5 ID No. 207, Seq. ID No. 213, Seq. ID No. 219, Seq. ID No. 221, Seq. ID No. 225,  
Seq. ID No. 227, Seq. ID No. 229, Seq. ID No. 233, Seq. ID No. 239, Seq. ID No.  
241, Seq. ID No. 243, Seq. ID No. 253, Seq. ID No. 261, Seq. ID No. 263, Seq.  
ID No. 267, Seq. ID No. 273, Seq. ID No. 275, Seq. ID No. 277, Seq. ID No. 279,  
Seq. ID No. 291, Seq. ID No. 293, Seq. ID No. 295, Seq. ID No. 299, Seq. ID No.  
10 303, Seq. ID No. 309, Seq. ID No. 311, Seq. ID No. 315, Seq. ID No. 319, Seq.  
ID No. 323, Seq. ID No. 331, Seq. ID No. 341, Seq. ID No. 345, Seq. ID No. 351,  
Seq. ID No. 355, Seq. ID No. 361, Seq. ID No. 363, Seq. ID No. 365, Seq. ID No.  
375, Seq. ID No. 379, Seq. ID No. 381, Seq. ID No. 383, Seq. ID No. 389, Seq.  
ID No. 391, Seq. ID No. 395, Seq. ID No. 399, Seq. ID No. 405, Seq. ID No. 409,  
15 Seq. ID No. 413, Seq. ID No. 417, Seq. ID No. 421, Seq. ID No. 423, Seq. ID No.  
425, Seq. ID No. 427, Seq. ID No. 429, Seq. ID No. 435, Seq. ID No. 437, Seq.  
ID No. 439, Seq. ID No. 441, Seq. ID No. 443, Seq. ID No. 445, Seq. ID No. 447,  
Seq. ID No. 449, Seq. ID No. 459, Seq. ID No. 465, Seq. ID No. 485, Seq. ID No.  
501, Seq. ID No. 505, Seq. ID No. 511, Seq. ID No. 513, Seq. ID No. 517, Seq.  
20 ID No. 519, Seq. ID No. 523, Seq. ID No. 529, Seq. ID No. 533, Seq. ID No. 535,  
Seq. ID No. 541, Seq. ID No. 543, Seq. ID No. 551, Seq. ID No. 553, Seq. ID No.  
559, Seq. ID No. 563, Seq. ID No. 569, Seq. ID No. 575, Seq. ID No. 579, Seq.  
ID No. 583, Seq. ID No. 591, Seq. ID No. 595, Seq. ID No. 601, Seq. ID No. 605,  
Seq. ID No. 607, Seq. ID No. 611, Seq. ID No. 613, Seq. ID No. 615, Seq. ID No.  
25 621, Seq. ID No. 627, Seq. ID No. 629, Seq. ID No. 633, Seq. ID No. 635, Seq.  
ID No. 637, Seq. ID No. 643, Seq. ID No. 649, Seq. ID No. 651, Seq. ID No. 655,  
Seq. ID No. 657, Seq. ID No. 669, Seq. ID No. 671, Seq. ID No. 675, Seq. ID No.  
681, Seq. ID No. 683, Seq. ID No. 685, Seq. ID No. 693, Seq. ID No. 703, Seq.  
ID No. 705, Seq. ID No. 711, Seq. ID No. 725, Seq. ID No. 731, Seq. ID No. 735,  
30 Seq. ID No. 737, Seq. ID No. 741, Seq. ID No. 743, Seq. ID No. 749, Seq. ID No.  
753, Seq. ID No. 759, Seq. ID No. 773, Seq. ID No. 781, Seq. ID No. 783, Seq.  
ID No. 785, Seq. ID No. 789, Seq. ID No. 793, Seq. ID No. 797, Seq. ID No. 803,  
Seq. ID No. 815, Seq. ID No. 819, Seq. ID No. 821, Seq. ID No. 827, Seq. ID No.



831, Seq. ID No. 833, Seq. ID No. 835, Seq. ID No. 837, Seq. ID No. 841, Seq.  
ID No. 843, Seq. ID No. 849, Seq. ID No. 851, Seq. ID No. 853, Seq. ID No. 857,  
Seq. ID No. 865, Seq. ID No. 869, Seq. ID No. 873, Seq. ID No. 877, Seq. ID No.  
883, Seq. ID No. 887, Seq. ID No. 891, Seq. ID No. 895, Seq. ID No. 901, Seq.  
5 ID No. 907, Seq. ID No. 911, Seq. ID No. 917, Seq. ID No. 921, Seq. ID No. 927,  
Seq. ID No. 935, Seq. ID No. 939, Seq. ID No. 945, Seq. ID No. 951, Seq. ID No.  
953, Seq. ID No. 959, Seq. ID No. 963, Seq. ID No. 967, Seq. ID No. 969, Seq.  
ID No. 977, Seq. ID No. 989, Seq. ID No. 995, Seq. ID No. 999, Seq. ID No.  
1005, Seq. ID No. 1007, Seq. ID No. 1015, Seq. ID No. 1021, Seq. ID No. 1035,  
10 Seq. ID No. 1041, Seq. ID No. 1043, Seq. ID No. 1049, Seq. ID No. 1053, Seq.  
ID No. 1057, Seq. ID No. 1059, Seq. ID No. 1063, Seq. ID No. 1067, Seq. ID No.  
1069, Seq. ID No. 1071, Seq. ID No. 1075, Seq. ID No. 1083, Seq. ID No. 1085,  
Seq. ID No. 1089, Seq. ID No. 1093, Seq. ID No. 1097, Seq. ID No. 1099, Seq.  
ID No. 1101, Seq. ID No. 1109, Seq. ID No. 1113, Seq. ID No. 1117, Seq. ID No.  
15 1121, Seq. ID No. 1129, Seq. ID No. 1133, Seq. ID No. 1137, Seq. ID No. 1141,  
Seq. ID No. 1145, Seq. ID No. 1149, Seq. ID No. 1155, Seq. ID No. 1157, Seq.  
ID No. 1159, Seq. ID No. 1163, Seq. ID No. 1171, Seq. ID No. 1173, Seq. ID No.  
1175, Seq. ID No. 1181, Seq. ID No. 1185, Seq. ID No. 1189, Seq. ID No. 1199,  
Seq. ID No. 1205, Seq. ID No. 1209, Seq. ID No. 1215, Seq. ID No. 1219, Seq.  
20 ID No. 1223, Seq. ID No. 1225, Seq. ID No. 1233, Seq. ID No. 1235, Seq. ID No.  
1241, Seq. ID No. 1251, Seq. ID No. 1255, Seq. ID No. 1261, Seq. ID No. 1271,  
Seq. ID No. 1281, Seq. ID No. 1315, Seq. ID No. 1323, Seq. ID No. 1331, Seq.  
ID No. 1333, Seq. ID No. 1339, Seq. ID No. 1345, Seq. ID No. 1347, Seq. ID No.  
1355, Seq. ID No. 1357, Seq. ID No. 1369, Seq. ID No. 1373, Seq. ID No. 1387,  
25 Seq. ID No. 1391, Seq. ID No. 1395, Seq. ID No. 1397, Seq. ID No. 1403, Seq.  
ID No. 1405, Seq. ID No. 1407, Seq. ID No. 1413, Seq. ID No. 1415, Seq. ID No.  
1417, Seq. ID No. 1425, Seq. ID No. 1427, Seq. ID No. 1429, Seq. ID No. 1431,  
Seq. ID No. 1433, Seq. ID No. 1435, Seq. ID No. 1439, Seq. ID No. 1441, Seq.  
ID No. 1451, Seq. ID No. 1453, Seq. ID No. 1459, Seq. ID No. 1461, Seq. ID No.  
30 1469, Seq. ID No. 1471, Seq. ID No. 1473, Seq. ID No. 1475, Seq. ID No. 1477,  
Seq. ID No. 1483, Seq. ID No. 1487, Seq. ID No. 1489, Seq. ID No. 1493, Seq.  
ID No. 1495, Seq. ID No. 1497, Seq. ID No. 1501, Seq. ID No. 1503, Seq. ID No.  
1507, Seq. ID No. 1509, Seq. ID No. 1517, Seq. ID No. 1521, Seq. ID No. 1527,

Seq. ID No. 1531, Seq. ID No. 1537, Seq. ID No. 1541, Seq. ID No. 1543, Seq.  
ID No. 1549, Seq. ID No. 1561, Seq. ID No. 1563, Seq. ID No. 1565, Seq. ID No.  
1569, Seq. ID No. 1573, Seq. ID No. 1575, Seq. ID No. 1581, Seq. ID No. 1587,  
Seq. ID No. 1591, Seq. ID No. 1595, Seq. ID No. 1597, Seq. ID No. 1605, Seq.  
5 ID No. 1609, Seq. ID No. 1613, Seq. ID No. 1619, Seq. ID No. 1623, Seq. ID No.  
1627, Seq. ID No. 1629, Seq. ID No. 1635, Seq. ID No. 1641, Seq. ID No. 1647,  
Seq. ID No. 1651, Seq. ID No. 1657, Seq. ID No. 1659, Seq. ID No. 1667, Seq.  
ID No. 1669, Seq. ID No. 1679, Seq. ID No. 1683, Seq. ID No. 1687, Seq. ID No.  
1691, Seq. ID No. 1697, Seq. ID No. 1699, Seq. ID No. 1701, Seq. ID No. 1707,  
10 Seq. ID No. 1709, Seq. ID No. 1713, Seq. ID No. 1717, Seq. ID No. 1721, Seq.  
ID No. 1725, Seq. ID No. 1735, Seq. ID No. 1737, Seq. ID No. 1739, Seq. ID No.  
1743, Seq. ID No. 1745, Seq. ID No. 1749, Seq. ID No. 1755, Seq. ID No. 1769,  
Seq. ID No. 1773, Seq. ID No. 1777, Seq. ID No. 1785, Seq. ID No. 1789, Seq.  
ID No. 1791, Seq. ID No. 1797, Seq. ID No. 1799, Seq. ID No. 1803, Seq. ID No.  
15 1805, Seq. ID No. 1807, Seq. ID No. 1817, Seq. ID No. 1819, Seq. ID No. 1821,  
Seq. ID No. 1825, Seq. ID No. 1827, Seq. ID No. 1831, Seq. ID No. 1835, Seq.  
ID No. 1841, Seq. ID No. 1845, Seq. ID No. 1847, Seq. ID No. 1849, Seq. ID No.  
1851, Seq. ID No. 1855, Seq. ID No. 1859, Seq. ID No. 1861, Seq. ID No. 1865,  
Seq. ID No. 1867, Seq. ID No. 1871, Seq. ID No. 1873, Seq. ID No. 1877, Seq.  
20 ID No. 1879, Seq. ID No. 1887, Seq. ID No. 1889, Seq. ID No. 1895, Seq. ID No.  
1897, Seq. ID No. 1899, Seq. ID No. 1901, Seq. ID No. 1905, Seq. ID No. 1909,  
Seq. ID No. 1917, Seq. ID No. 1921, Seq. ID No. 1925, Seq. ID No. 1931, Seq.  
ID No. 1933, Seq. ID No. 1937, Seq. ID No. 1939, Seq. ID No. 1945, Seq. ID No.  
1947, Seq. ID No. 1951, Seq. ID No. 1955, Seq. ID No. 1959, Seq. ID No. 1961,  
25 Seq. ID No. 1965, Seq. ID No. 1967, Seq. ID No. 1969, Seq. ID No. 1973, Seq.  
ID No. 1977, Seq. ID No. 1979, Seq. ID No. 1983, Seq. ID No. 1989, Seq. ID No.  
1991, Seq. ID No. 1997, Seq. ID No. 2001, Seq. ID No. 2003, Seq. ID No. 2011,  
Seq. ID No. 2021, Seq. ID No. 2023, Seq. ID No. 2029, Seq. ID No. 2033, Seq.  
ID No. 2037, Seq. ID No. 2039, Seq. ID No. 2045, Seq. ID No. 2047, Seq. ID No.  
30 2051, Seq. ID No. 2057, Seq. ID No. 2061, Seq. ID No. 2067, Seq. ID No. 2069,  
Seq. ID No. 2071, Seq. ID No. 2073, Seq. ID No. 2077, Seq. ID No. 2089, Seq.  
ID No. 2093, Seq. ID No. 2095, Seq. ID No. 2099, Seq. ID No. 2101, Seq. ID No.  
2113, Seq. ID No. 2117, Seq. ID No. 2123, Seq. ID No. 2135, Seq. ID No. 2137,

Seq. ID No. 2139, Seq. ID No. 2143, Seq. ID No. 2147, Seq. ID No. 2153, Seq.  
ID No. 2159, Seq. ID No. 2163, Seq. ID No. 2167, Seq. ID No. 2175, Seq. ID No.  
2181, Seq. ID No. 2185, Seq. ID No. 2189, Seq. ID No. 2193, Seq. ID No. 2195,  
Seq. ID No. 2197, Seq. ID No. 2205, Seq. ID No. 2217, Seq. ID No. 2219, Seq.  
5 ID No. 2223, Seq. ID No. 2225, Seq. ID No. 2229, Seq. ID No. 2235, Seq. ID No.  
2239, Seq. ID No. 2243, Seq. ID No. 2245, Seq. ID No. 2247, Seq. ID No. 2253,  
Seq. ID No. 2255, Seq. ID No. 2257, Seq. ID No. 2259, Seq. ID No. 2261, Seq.  
ID No. 2265, Seq. ID No. 2269, Seq. ID No. 2273, Seq. ID No. 2285, Seq. ID No.  
2297, Seq. ID No. 2299, Seq. ID No. 2301, Seq. ID No. 2313, Seq. ID No. 2327,  
10 Seq. ID No. 2331, Seq. ID No. 2335, Seq. ID No. 2337, Seq. ID No. 2341, Seq.  
ID No. 2343, Seq. ID No. 2345, Seq. ID No. 2349, Seq. ID No. 2351, Seq. ID No.  
2357, Seq. ID No. 2359, Seq. ID No. 2361, Seq. ID No. 2365, Seq. ID No. 2369,  
Seq. ID No. 2373, Seq. ID No. 2377, Seq. ID No. 2383, Seq. ID No. 2397, Seq.  
ID No. 2401, Seq. ID No. 2403, Seq. ID No. 2409, Seq. ID No. 2411, Seq. ID No.  
15 2417, Seq. ID No. 2421, Seq. ID No. 2423, Seq. ID No. 2425, Seq. ID No. 2429,  
Seq. ID No. 2435, Seq. ID No. 2437, Seq. ID No. 2439, Seq. ID No. 2441, Seq.  
ID No. 2445, Seq. ID No. 2449, Seq. ID No. 2451, Seq. ID No. 2453, Seq. ID No.  
2461, Seq. ID No. 2465, Seq. ID No. 2467, Seq. ID No. 2471, Seq. ID No. 2473,  
Seq. ID No. 2477, Seq. ID No. 2479, Seq. ID No. 2481, Seq. ID No. 2485, Seq.  
20 ID No. 2487, Seq. ID No. 2495, Seq. ID No. 2505, Seq. ID No. 2507, Seq. ID No.  
2509, Seq. ID No. 2519, Seq. ID No. 2525, Seq. ID No. 2527, Seq. ID No. 2529,  
Seq. ID No. 2535, Seq. ID No. 2537, Seq. ID No. 2539, Seq. ID No. 2547, Seq.  
ID No. 2551, Seq. ID No. 2563, Seq. ID No. 2565, Seq. ID No. 2573, Seq. ID No.  
2577, Seq. ID No. 2579, Seq. ID No. 2585, Seq. ID No. 2593, Seq. ID No. 2595,  
25 Seq. ID No. 2599, Seq. ID No. 2607, Seq. ID No. 2609, Seq. ID No. 2613, Seq.  
ID No. 2615, Seq. ID No. 2619, Seq. ID No. 2623, Seq. ID No. 2625, Seq. ID No.  
2631, Seq. ID No. 2633, Seq. ID No. 2639, Seq. ID No. 2641, Seq. ID No. 2643,  
Seq. ID No. 2647, Seq. ID No. 2651, Seq. ID No. 2655, Seq. ID No. 2657, Seq.  
ID No. 2661, Seq. ID No. 2665, Seq. ID No. 2669, Seq. ID No. 2671, Seq. ID No.  
30 2673, Seq. ID No. 2681, Seq. ID No. 2689, Seq. ID No. 2693, Seq. ID No. 2699,  
Seq. ID No. 2703, Seq. ID No. 2709, Seq. ID No. 2711, Seq. ID No. 2713, Seq.  
ID No. 2719, Seq. ID No. 2721, Seq. ID No. 2727, Seq. ID No. 2737, Seq. ID No.  
2741, Seq. ID No. 2745, Seq. ID No. 2749, Seq. ID No. 2753, Seq. ID No. 2757,

Seq. ID No. 2761, Seq. ID No. 2765, Seq. ID No. 2767, Seq. ID No. 2769, Seq.  
ID No. 2773, Seq. ID No. 2775, Seq. ID No. 2777, Seq. ID No. 2787, Seq. ID No.  
2789, Seq. ID No. 2791, Seq. ID No. 2793, Seq. ID No. 2795, Seq. ID No. 2799,  
Seq. ID No. 2803, Seq. ID No. 2815, Seq. ID No. 2817, Seq. ID No. 2819, Seq.  
5 ID No. 2825, Seq. ID No. 2843, Seq. ID No. 2847, Seq. ID No. 2849, Seq. ID No.  
2851, Seq. ID No. 2857, Seq. ID No. 2859, Seq. ID No. 2863, Seq. ID No. 2867,  
Seq. ID No. 2869, Seq. ID No. 2871, Seq. ID No. 2877, Seq. ID No. 2879, Seq.  
ID No. 2889, Seq. ID No. 2891, Seq. ID No. 2897, Seq. ID No. 2901, Seq. ID No.  
2903, Seq. ID No. 2907, Seq. ID No. 2909, Seq. ID No. 2913, Seq. ID No. 2915,  
10 Seq. ID No. 2919, Seq. ID No. 2921, Seq. ID No. 2923, Seq. ID No. 2925, Seq.  
ID No. 2929, Seq. ID No. 2935, Seq. ID No. 2943, Seq. ID No. 2951, Seq. ID No.  
2955, Seq. ID No. 2963, Seq. ID No. 2965, Seq. ID No. 2971, Seq. ID No. 2973,  
Seq. ID No. 2975, Seq. ID No. 2979, Seq. ID No. 2981, Seq. ID No. 2985, Seq.  
ID No. 2989, Seq. ID No. 2993, Seq. ID No. 2999, Seq. ID No. 3001, Seq. ID No.  
15 3003, Seq. ID No. 3017, Seq. ID No. 3027, Seq. ID No. 3033, Seq. ID No. 3035,  
Seq. ID No. 3039, Seq. ID No. 3041, Seq. ID No. 3043, Seq. ID No. 3045, Seq.  
ID No. 3047, Seq. ID No. 3055, Seq. ID No. 3057, Seq. ID No. 3061, Seq. ID No.  
3065, Seq. ID No. 3069, Seq. ID No. 3079, Seq. ID No. 3089, Seq. ID No. 3091,  
Seq. ID No. 3093, Seq. ID No. 3095, Seq. ID No. 3103, Seq. ID No. 3105, Seq.  
20 ID No. 3109, Seq. ID No. 3113, Seq. ID No. 3125, Seq. ID No. 3127, Seq. ID No.  
3135, Seq. ID No. 3137, Seq. ID No. 3141, Seq. ID No. 3143, Seq. ID No. 3147,  
Seq. ID No. 3155, Seq. ID No. 3157, Seq. ID No. 3159, Seq. ID No. 3161, Seq.  
ID No. 3165, Seq. ID No. 3169, Seq. ID No. 3175, Seq. ID No. 3179, Seq. ID No.  
3183, Seq. ID No. 3185, Seq. ID No. 3189, Seq. ID No. 3191, Seq. ID No. 3195,  
25 Seq. ID No. 3199, Seq. ID No. 3205, Seq. ID No. 3211, Seq. ID No. 3217, Seq.  
ID No. 3221, Seq. ID No. 3225, Seq. ID No. 3229, Seq. ID No. 3231, Seq. ID No.  
3237, Seq. ID No. 3239, Seq. ID No. 3247, Seq. ID No. 3251, Seq. ID No. 3253,  
Seq. ID No. 3255, Seq. ID No. 3259, Seq. ID No. 3261, Seq. ID No. 3267, Seq.  
ID No. 3273, Seq. ID No. 3277, Seq. ID No. 3279, Seq. ID No. 3285, Seq. ID No.  
30 3287, Seq. ID No. 3289, Seq. ID No. 3293, Seq. ID No. 3295, Seq. ID No. 3299,  
Seq. ID No. 3301, Seq. ID No. 3305, Seq. ID No. 3309, Seq. ID No. 3315, Seq.  
ID No. 3319, Seq. ID No. 3321, Seq. ID No. 3327, Seq. ID No. 3333, Seq. ID No.  
3337, Seq. ID No. 3343, Seq. ID No. 3353, Seq. ID No. 3359, Seq. ID No. 3361,

Seq. ID No. 3365, Seq. ID No. 3373, Seq. ID No. 3381, Seq. ID No. 3385, Seq.  
ID No. 3393, Seq. ID No. 3401, Seq. ID No. 3407, Seq. ID No. 3411, Seq. ID No.  
3415, Seq. ID No. 3417, Seq. ID No. 3423, Seq. ID No. 3429, Seq. ID No. 3437,  
Seq. ID No. 3439, Seq. ID No. 3443, Seq. ID No. 3459, Seq. ID No. 3461, Seq.  
5 ID No. 3465, Seq. ID No. 3469, Seq. ID No. 3471, Seq. ID No. 3473, Seq. ID No.  
3475, Seq. ID No. 3477, Seq. ID No. 3483, Seq. ID No. 3487, Seq. ID No. 3495,  
Seq. ID No. 3497, Seq. ID No. 3505, Seq. ID No. 3507, Seq. ID No. 3509, Seq.  
ID No. 3511, Seq. ID No. 3515, Seq. ID No. 3521, Seq. ID No. 3523, Seq. ID No.  
3529, Seq. ID No. 3535, Seq. ID No. 3541, Seq. ID No. 3551, Seq. ID No. 3559,  
10 Seq. ID No. 3563, Seq. ID No. 3567, Seq. ID No. 3575, Seq. ID No. 3577, Seq.  
ID No. 3583, Seq. ID No. 3585, Seq. ID No. 3589, Seq. ID No. 3591, Seq. ID No.  
3599, Seq. ID No. 3601, Seq. ID No. 3607, Seq. ID No. 3609, Seq. ID No. 3611,  
Seq. ID No. 3615, Seq. ID No. 3619, Seq. ID No. 3629, Seq. ID No. 3631, Seq.  
ID No. 3633, Seq. ID No. 3637, Seq. ID No. 3641, Seq. ID No. 3643, Seq. ID No.  
15 3645, Seq. ID No. 3651, Seq. ID No. 3653, Seq. ID No. 3655, Seq. ID No. 3661,  
Seq. ID No. 3665, Seq. ID No. 3667, Seq. ID No. 3669, Seq. ID No. 3675, Seq.  
ID No. 3681, Seq. ID No. 3689, Seq. ID No. 3695, Seq. ID No. 3697, Seq. ID No.  
3705, Seq. ID No. 3711, Seq. ID No. 3719, Seq. ID No. 3725, Seq. ID No. 3729,  
Seq. ID No. 3731, Seq. ID No. 3735, Seq. ID No. 3739, Seq. ID No. 3741, Seq.  
20 ID No. 3743, Seq. ID No. 3749, Seq. ID No. 3759, Seq. ID No. 3769, Seq. ID No.  
3773, Seq. ID No. 3777, Seq. ID No. 3781, Seq. ID No. 3787, Seq. ID No. 3795,  
Seq. ID No. 3801, Seq. ID No. 3805, Seq. ID No. 3809, Seq. ID No. 3813, Seq.  
ID No. 3819, Seq. ID No. 3821, Seq. ID No. 3825, Seq. ID No. 3827, Seq. ID No.  
3829, Seq. ID No. 3831, Seq. ID No. 3835, Seq. ID No. 3841, Seq. ID No. 3845,  
25 Seq. ID No. 3855, Seq. ID No. 3857, Seq. ID No. 3863, Seq. ID No. 3867, Seq.  
ID No. 3869, Seq. ID No. 3875, Seq. ID No. 3881, Seq. ID No. 3883, Seq. ID No.  
3885, Seq. ID No. 3887, Seq. ID No. 3897, Seq. ID No. 3901, Seq. ID No. 3905,  
Seq. ID No. 3909, Seq. ID No. 3913, Seq. ID No. 3915, Seq. ID No. 3917, Seq.  
ID No. 3919, Seq. ID No. 3921, Seq. ID No. 3929, Seq. ID No. 3931, Seq. ID No.  
30 3935, Seq. ID No. 3941, Seq. ID No. 3943, Seq. ID No. 3945, Seq. ID No. 3947,  
Seq. ID No. 3951, Seq. ID No. 3953, Seq. ID No. 3957, Seq. ID No. 3971, Seq.  
ID No. 3977, Seq. ID No. 3981, Seq. ID No. 3985, Seq. ID No. 3987, Seq. ID No.  
3989, Seq. ID No. 3993, Seq. ID No. 4001, Seq. ID No. 4005, Seq. ID No. 4011,

Seq. ID No. 4015, Seq. ID No. 4017, Seq. ID No. 4019, Seq. ID No. 4023, Seq.  
ID No. 4029, Seq. ID No. 4031, Seq. ID No. 4033, Seq. ID No. 4037, Seq. ID No.  
4039, Seq. ID No. 4049, Seq. ID No. 4051, Seq. ID No. 4057, Seq. ID No. 4059,  
Seq. ID No. 4065, Seq. ID No. 4069, Seq. ID No. 4075, Seq. ID No. 4079, Seq.  
5 ID No. 4085, Seq. ID No. 4089, Seq. ID No. 4095, Seq. ID No. 4097, Seq. ID No.  
4099, Seq. ID No. 4105, Seq. ID No. 4111, Seq. ID No. 4115, Seq. ID No. 4121,  
Seq. ID No. 4123, Seq. ID No. 4127, Seq. ID No. 4129, Seq. ID No. 4131, Seq.  
ID No. 4137, Seq. ID No. 4141, Seq. ID No. 4147, Seq. ID No. 4157, Seq. ID No.  
4159, Seq. ID No. 4163, Seq. ID No. 4165, Seq. ID No. 4169, Seq. ID No. 4179,  
10 Seq. ID No. 4183, Seq. ID No. 4187, Seq. ID No. 4193, Seq. ID No. 4195, Seq.  
ID No. 4197, Seq. ID No. 4199, Seq. ID No. 4201, Seq. ID No. 4205, Seq. ID No.  
4207, Seq. ID No. 4213, Seq. ID No. 4219, Seq. ID No. 4235, Seq. ID No. 4237,  
Seq. ID No. 4239, Seq. ID No. 4243, Seq. ID No. 4245, Seq. ID No. 4255, Seq.  
ID No. 4259, Seq. ID No. 4267, Seq. ID No. 4271, Seq. ID No. 4277, Seq. ID No.  
15 4279, Seq. ID No. 4281, Seq. ID No. 4283, Seq. ID No. 4289, Seq. ID No. 4293,  
Seq. ID No. 4299, Seq. ID No. 4301, Seq. ID No. 4303, Seq. ID No. 4305, Seq.  
ID No. 4307, Seq. ID No. 4309, Seq. ID No. 4313, Seq. ID No. 4315, Seq. ID No.  
4323, Seq. ID No. 4325, Seq. ID No. 4327, Seq. ID No. 4331, Seq. ID No. 4333,  
Seq. ID No. 4337, Seq. ID No. 4341, Seq. ID No. 4345, Seq. ID No. 4349, Seq.  
20 ID No. 4355, Seq. ID No. 4357, Seq. ID No. 4365, Seq. ID No. 4367, Seq. ID No.  
4371, Seq. ID No. 4375, Seq. ID No. 4377, Seq. ID No. 4379, Seq. ID No. 4383,  
Seq. ID No. 4387, Seq. ID No. 4393, Seq. ID No. 4397, Seq. ID No. 4401, Seq.  
ID No. 4409, Seq. ID No. 4413, Seq. ID No. 4421, Seq. ID No. 4433, Seq. ID No.  
4435, Seq. ID No. 4445, Seq. ID No. 4449, Seq. ID No. 4457, Seq. ID No. 4461,  
25 Seq. ID No. 4463, Seq. ID No. 4471, Seq. ID No. 4475, Seq. ID No. 4477, Seq.  
ID No. 4481, Seq. ID No. 4487, Seq. ID No. 4491, Seq. ID No. 4499, Seq. ID No.  
4501, Seq. ID No. 4503, Seq. ID No. 4509, Seq. ID No. 4517, Seq. ID No. 4531,  
Seq. ID No. 4533, Seq. ID No. 4535, Seq. ID No. 4539, Seq. ID No. 4541, Seq.  
ID No. 4545, Seq. ID No. 4549, Seq. ID No. 4557, Seq. ID No. 4563, Seq. ID No.  
30 4567, Seq. ID No. 4569, Seq. ID No. 4575, Seq. ID No. 4577, Seq. ID No. 4579,  
Seq. ID No. 4583, Seq. ID No. 4591, Seq. ID No. 4593, Seq. ID No. 4597, Seq.  
ID No. 4601, Seq. ID No. 4605, Seq. ID No. 4609, Seq. ID No. 4611, Seq. ID No.  
4613, Seq. ID No. 4623, Seq. ID No. 4625, Seq. ID No. 4629, Seq. ID No. 4633,

Seq. ID No. 4637, Seq. ID No. 4641, Seq. ID No. 4645, Seq. ID No. 4651, Seq.  
ID No. 4653, Seq. ID No. 4655, Seq. ID No. 4661, Seq. ID No. 4663, Seq. ID No.  
4669, Seq. ID No. 4671, Seq. ID No. 4673, Seq. ID No. 4675, Seq. ID No. 4685,  
Seq. ID No. 4689, Seq. ID No. 4697, Seq. ID No. 4703, Seq. ID No. 4705, Seq.  
5 ID No. 4713, Seq. ID No. 4717, Seq. ID No. 4719, Seq. ID No. 4723, Seq. ID No.  
4729, Seq. ID No. 4731, Seq. ID No. 4733, Seq. ID No. 4739, Seq. ID No. 4743,  
Seq. ID No. 4745, Seq. ID No. 4747, Seq. ID No. 4749, Seq. ID No. 4751, Seq.  
ID No. 4753, Seq. ID No. 4761, Seq. ID No. 4767, Seq. ID No. 4771, Seq. ID No.  
4779, Seq. ID No. 4781, Seq. ID No. 4783, Seq. ID No. 4785, Seq. ID No. 4789,  
10 Seq. ID No. 4791, Seq. ID No. 4793, Seq. ID No. 4799, Seq. ID No. 4807, Seq.  
ID No. 4809, Seq. ID No. 4811, Seq. ID No. 4813, Seq. ID No. 4815, Seq. ID No.  
4821, Seq. ID No. 4825, Seq. ID No. 4827, Seq. ID No. 4829, Seq. ID No. 4837,  
Seq. ID No. 4839, Seq. ID No. 4845, Seq. ID No. 4847, Seq. ID No. 4849, Seq.  
ID No. 4857, Seq. ID No. 4861, Seq. ID No. 4865, Seq. ID No. 4867, Seq. ID No.  
15 4875, Seq. ID No. 4879, Seq. ID No. 4881, Seq. ID No. 4883, Seq. ID No. 4885,  
Seq. ID No. 4887, Seq. ID No. 4893, Seq. ID No. 4899, Seq. ID No. 4901, Seq.  
ID No. 4903, Seq. ID No. 4905, Seq. ID No. 4907, Seq. ID No. 4909, Seq. ID No.  
4915, Seq. ID No. 4917, Seq. ID No. 4919, Seq. ID No. 4921, Seq. ID No. 4925,  
Seq. ID No. 4929, Seq. ID No. 4933, Seq. ID No. 4937, Seq. ID No. 4941, Seq.  
20 ID No. 4943, Seq. ID No. 4945, Seq. ID No. 4947, Seq. ID No. 4953, Seq. ID No.  
4955, Seq. ID No. 4959, Seq. ID No. 4961, Seq. ID No. 4965, Seq. ID No. 4967,  
Seq. ID No. 4971, Seq. ID No. 4973, Seq. ID No. 4977, Seq. ID No. 4985, Seq.  
ID No. 4989, Seq. ID No. 4991, Seq. ID No. 4995, Seq. ID No. 4997, Seq. ID No.  
5005, Seq. ID No. 5009, Seq. ID No. 5015, Seq. ID No. 5019, Seq. ID No. 5025,  
25 Seq. ID No. 5029, Seq. ID No. 5037, Seq. ID No. 5045, Seq. ID No. 5049, Seq.  
ID No. 5053, Seq. ID No. 5055, Seq. ID No. 5059, Seq. ID No. 5061, Seq. ID No.  
5065, Seq. ID No. 5071, Seq. ID No. 5073, Seq. ID No. 5079, Seq. ID No. 5081,  
Seq. ID No. 5083, Seq. ID No. 5087, Seq. ID No. 5089, Seq. ID No. 5093, Seq.  
ID No. 5095, Seq. ID No. 5103, Seq. ID No. 5105, Seq. ID No. 5107, Seq. ID No.  
30 5111, Seq. ID No. 5113, Seq. ID No. 5115, Seq. ID No. 5117, Seq. ID No. 5119,  
Seq. ID No. 5141, Seq. ID No. 5143, Seq. ID No. 5147, Seq. ID No. 5153, Seq.  
ID No. 5155, Seq. ID No. 5163, Seq. ID No. 5169, Seq. ID No. 5171, Seq. ID No.  
5173, Seq. ID No. 5179, Seq. ID No. 5185, Seq. ID No. 5187, Seq. ID No. 5193,

Seq. ID No. 5195, Seq. ID No. 5201, Seq. ID No. 5203, Seq. ID No. 5205, Seq.  
ID No. 5209, Seq. ID No. 5211, Seq. ID No. 5213, Seq. ID No. 5217, Seq. ID No.  
5225, Seq. ID No. 5231, Seq. ID No. 5233, Seq. ID No. 5237, Seq. ID No. 5239,  
Seq. ID No. 5245, Seq. ID No. 5247, Seq. ID No. 5249, Seq. ID No. 5255, Seq.  
5 ID No. 5257, Seq. ID No. 5259, Seq. ID No. 5263, Seq. ID No. 5269, Seq. ID No.  
5273, Seq. ID No. 5283, Seq. ID No. 5289, Seq. ID No. 5293, Seq. ID No. 5307,  
Seq. ID No. 5311, Seq. ID No. 5313, Seq. ID No. 5315, Seq. ID No. 5323, Seq.  
ID No. 5325, Seq. ID No. 5335, Seq. ID No. 5337, Seq. ID No. 5339, Seq. ID No.  
5345, Seq. ID No. 5347, Seq. ID No. 5349, Seq. ID No. 5353, Seq. ID No. 5361,  
10 Seq. ID No. 5365, Seq. ID No. 5367, Seq. ID No. 5369, Seq. ID No. 5373, Seq.  
ID No. 5375, Seq. ID No. 5387, Seq. ID No. 5389, Seq. ID No. 5391, Seq. ID No.  
5393, Seq. ID No. 5395, Seq. ID No. 5397, Seq. ID No. 5399, Seq. ID No. 5401,  
Seq. ID No. 5403, Seq. ID No. 5405, Seq. ID No. 5411, Seq. ID No. 5415, Seq.  
ID No. 5417, Seq. ID No. 5419, Seq. ID No. 5421, Seq. ID No. 5423, Seq. ID No.  
15 5429, Seq. ID No. 5433, Seq. ID No. 5441, Seq. ID No. 5443, Seq. ID No. 5445,  
Seq. ID No. 5449, Seq. ID No. 5451, Seq. ID No. 5453, Seq. ID No. 5455, Seq.  
ID No. 5457, Seq. ID No. 5469, Seq. ID No. 5475, Seq. ID No. 5483, Seq. ID No.  
5485, Seq. ID No. 5489, Seq. ID No. 5493, Seq. ID No. 5499, Seq. ID No. 5501,  
Seq. ID No. 5505, Seq. ID No. 5509, Seq. ID No. 5511, Seq. ID No. 5523, Seq.  
20 ID No. 5529, Seq. ID No. 5535, Seq. ID No. 5539, Seq. ID No. 5541, Seq. ID No.  
5547, Seq. ID No. 5551, Seq. ID No. 5555, Seq. ID No. 5559, Seq. ID No. 5561,  
Seq. ID No. 5565, Seq. ID No. 5571, Seq. ID No. 5573, Seq. ID No. 5579, Seq.  
ID No. 5583, Seq. ID No. 5589, Seq. ID No. 5599, Seq. ID No. 5601, Seq. ID No.  
5603, Seq. ID No. 5613, Seq. ID No. 5621, Seq. ID No. 5627, Seq. ID No. 5631,  
25 Seq. ID No. 5635, Seq. ID No. 5645, Seq. ID No. 5651, Seq. ID No. 5653, Seq.  
ID No. 5657, Seq. ID No. 5661, Seq. ID No. 5663, Seq. ID No. 5665, Seq. ID No.  
5669, Seq. ID No. 5671, Seq. ID No. 5673, Seq. ID No. 5675, Seq. ID No. 5681,  
Seq. ID No. 5693, Seq. ID No. 5695, Seq. ID No. 5699, Seq. ID No. 5701, Seq.  
ID No. 5707, Seq. ID No. 5713, Seq. ID No. 5717, Seq. ID No. 5723, Seq. ID No.  
30 5725, Seq. ID No. 5731, Seq. ID No. 5737, Seq. ID No. 5747, Seq. ID No. 5751,  
Seq. ID No. 5755, Seq. ID No. 5759, Seq. ID No. 5771, Seq. ID No. 5773, Seq.  
ID No. 5777, Seq. ID No. 5779, Seq. ID No. 5781, Seq. ID No. 5785, Seq. ID No.  
5793, Seq. ID No. 5799, Seq. ID No. 5805, Seq. ID No. 5811, Seq. ID No. 5815,



Seq. ID No. 5817, Seq. ID No. 5823, Seq. ID No. 5831, Seq. ID No. 5835, Seq.  
ID No. 5839, Seq. ID No. 5843, Seq. ID No. 5847, Seq. ID No. 5849, Seq. ID No.  
5851, Seq. ID No. 5853, Seq. ID No. 5855, Seq. ID No. 5857, Seq. ID No. 5861,  
Seq. ID No. 5867, Seq. ID No. 5875, Seq. ID No. 5877, Seq. ID No. 5881, Seq.  
5 ID No. 5889, Seq. ID No. 5895, Seq. ID No. 5897, Seq. ID No. 5901, Seq. ID No.  
5903, Seq. ID No. 5907, Seq. ID No. 5913, Seq. ID No. 5915, Seq. ID No. 5917,  
Seq. ID No. 5919, Seq. ID No. 5925, Seq. ID No. 5931, Seq. ID No. 5933, Seq.  
ID No. 5935, Seq. ID No. 5941, Seq. ID No. 5943, Seq. ID No. 5945, Seq. ID No.  
5949, Seq. ID No. 5955, Seq. ID No. 5957, Seq. ID No. 5959, Seq. ID No. 5967,  
10 Seq. ID No. 5971, Seq. ID No. 5975, Seq. ID No. 5977, Seq. ID No. 5981, Seq.  
ID No. 5983, Seq. ID No. 5985, Seq. ID No. 5989, Seq. ID No. 5991, Seq. ID No.  
5995, Seq. ID No. 5997, Seq. ID No. 6003, Seq. ID No. 6005, Seq. ID No. 6007,  
Seq. ID No. 6015, Seq. ID No. 6017, Seq. ID No. 6019, Seq. ID No. 6023, Seq.  
ID No. 6029, Seq. ID No. 6033, Seq. ID No. 6035, Seq. ID No. 6037, Seq. ID No.  
15 6043, Seq. ID No. 6049, Seq. ID No. 6055, Seq. ID No. 6065, Seq. ID No. 6069,  
Seq. ID No. 6075, Seq. ID No. 6081, Seq. ID No. 6083, Seq. ID No. 6087, Seq.  
ID No. 6095, Seq. ID No. 6097, Seq. ID No. 6099, Seq. ID No. 6103, Seq. ID No.  
6105, Seq. ID No. 6113, Seq. ID No. 6115, Seq. ID No. 6119, Seq. ID No. 6125,  
Seq. ID No. 6127, Seq. ID No. 6129, Seq. ID No. 6131, Seq. ID No. 6133, Seq.  
20 ID No. 6141, Seq. ID No. 6143, Seq. ID No. 6147, Seq. ID No. 6153, Seq. ID No.  
6165, Seq. ID No. 6169, Seq. ID No. 6171, Seq. ID No. 6173, Seq. ID No. 6177,  
Seq. ID No. 6179, Seq. ID No. 6187, Seq. ID No. 6193, Seq. ID No. 6201, Seq.  
ID No. 6207, Seq. ID No. 6211, Seq. ID No. 6215, Seq. ID No. 6219, Seq. ID No.  
6231, Seq. ID No. 6235, Seq. ID No. 6243, Seq. ID No. 6247, Seq. ID No. 6251,  
25 Seq. ID No. 6255, Seq. ID No. 6261, Seq. ID No. 6263, Seq. ID No. 6269, Seq.  
ID No. 6275, Seq. ID No. 6277, Seq. ID No. 6279, Seq. ID No. 6287, Seq. ID No.  
6291, Seq. ID No. 6299, Seq. ID No. 6305, Seq. ID No. 6307, Seq. ID No. 6313,  
Seq. ID No. 6315, Seq. ID No. 6321, Seq. ID No. 6323, Seq. ID No. 6325, Seq.  
ID No. 6331, Seq. ID No. 6335, Seq. ID No. 6339, Seq. ID No. 6341, Seq. ID No.  
30 6343, Seq. ID No. 6345, Seq. ID No. 6347, Seq. ID No. 6355, Seq. ID No. 6359,  
Seq. ID No. 6361, Seq. ID No. 6365, Seq. ID No. 6369, Seq. ID No. 6371, Seq.  
ID No. 6375, Seq. ID No. 6377, Seq. ID No. 6379, Seq. ID No. 6387, Seq. ID No.  
6391, Seq. ID No. 6397, Seq. ID No. 6401, Seq. ID No. 6405, Seq. ID No. 6409,

Seq. ID No. 6413, Seq. ID No. 6417, Seq. ID No. 6419, Seq. ID No. 6423, Seq. ID No. 6429, Seq. ID No. 6433, Seq. ID No. 6435, Seq. ID No. 6439, Seq. ID No. 6445, Seq. ID No. 6447, Seq. ID No. 6451, Seq. ID No. 6455, Seq. ID No. 6459, Seq. ID No. 6461, Seq. ID No. 6463, Seq. ID No. 6475, Seq. ID No. 6481, Seq. ID No. 6483, Seq. ID No. 6485, Seq. ID No. 6487, Seq. ID No. 6489, Seq. ID No. 6491, Seq. ID No. 6493, Seq. ID No. 6495, Seq. ID No. 6499, Seq. ID No. 6505, Seq. ID No. 6509, Seq. ID No. 6513, Seq. ID No. 6519, Seq. ID No. 6521, Seq. ID No. 6525, Seq. ID No. 6527, Seq. ID No. 6531, Seq. ID No. 6533, Seq. ID No. 6535, Seq. ID No. 6545, Seq. ID No. 6551, Seq. ID No. 6553, Seq. ID No. 6559, Seq. ID No. 6561, Seq. ID No. 6563, Seq. ID No. 6565, Seq. ID No. 6567, Seq. ID No. 6569, Seq. ID No. 6575, Seq. ID No. 6579, Seq. ID No. 6583, Seq. ID No. 6585, Seq. ID No. 6591, Seq. ID No. 6595, Seq. ID No. 6605, Seq. ID No. 6607, Seq. ID No. 6611, Seq. ID No. 6615, Seq. ID No. 6617, Seq. ID No. 6619, Seq. ID No. 6623, Seq. ID No. 6625, Seq. ID No. 6629, Seq. ID No. 6633, Seq. ID No. 6635, Seq. ID No. 6641, and Seq. ID No. 6647.

29. The polynucleotide of claim 7, wherein the polynucleotide that encodes a polypeptide is identified using an ORF finder program that searches for an ATG, GTG or TTG Start codon between a Stop-Stop region, and the polynucleotide is selected from one of Seq. ID No. 1, Seq. ID No. 5, Seq. ID No. 11, Seq. ID No. 13, Seq. ID No. 15, Seq. ID No. 17, Seq. ID No. 19, Seq. ID No. 21, Seq. ID No. 23, Seq. ID No. 27, Seq. ID No. 29, Seq. ID No. 31, Seq. ID No. 35, Seq. ID No. 37, Seq. ID No. 41, Seq. ID No. 43, Seq. ID No. 45, Seq. ID No. 47, Seq. ID No. 49, Seq. ID No. 51, Seq. ID No. 53, Seq. ID No. 55, Seq. ID No. 57, Seq. ID No. 59, Seq. ID No. 65, Seq. ID No. 67, Seq. ID No. 75, Seq. ID No. 77, Seq. ID No. 79, Seq. ID No. 81, Seq. ID No. 83, Seq. ID No. 89, Seq. ID No. 91, Seq. ID No. 93, Seq. ID No. 97, Seq. ID No. 99, Seq. ID No. 103, Seq. ID No. 105, Seq. ID No. 107, Seq. ID No. 109, Seq. ID No. 111, Seq. ID No. 113, Seq. ID No. 115, Seq. ID No. 117, Seq. ID No. 119, Seq. ID No. 121, Seq. ID No. 127, Seq. ID No. 129, Seq. ID No. 131, Seq. ID No. 133, Seq. ID No. 135, Seq. ID No. 137, Seq. ID No. 139, Seq. ID No. 143, Seq. ID No. 145, Seq. ID No. 147, Seq. ID No. 149, Seq. ID No. 153, Seq. ID No. 155, Seq. ID No. 157, Seq. ID No. 159, Seq. ID No. 161, Seq. ID No. 163, Seq. ID No. 165, Seq. ID No. 167, Seq. ID No. 169, Seq.

5 ID No. 171, Seq. ID No. 175, Seq. ID No. 177, Seq. ID No. 179, Seq. ID No. 181,  
Seq. ID No. 183, Seq. ID No. 187, Seq. ID No. 191, Seq. ID No. 193, Seq. ID No.  
195, Seq. ID No. 201, Seq. ID No. 205, Seq. ID No. 207, Seq. ID No. 215, Seq.  
ID No. 219, Seq. ID No. 221, Seq. ID No. 223, Seq. ID No. 225, Seq. ID No. 227,  
Seq. ID No. 231, Seq. ID No. 233, Seq. ID No. 239, Seq. ID No. 243, Seq. ID No.  
245, Seq. ID No. 247, Seq. ID No. 253, Seq. ID No. 257, Seq. ID No. 259, Seq.  
ID No. 261, Seq. ID No. 263, Seq. ID No. 265, Seq. ID No. 267, Seq. ID No. 269,  
Seq. ID No. 273, Seq. ID No. 277, Seq. ID No. 279, Seq. ID No. 281, Seq. ID No.  
283, Seq. ID No. 291, Seq. ID No. 293, Seq. ID No. 297, Seq. ID No. 301, Seq.  
10 ID No. 305, Seq. ID No. 307, Seq. ID No. 309, Seq. ID No. 313, Seq. ID No. 317,  
Seq. ID No. 321, Seq. ID No. 323, Seq. ID No. 325, Seq. ID No. 331, Seq. ID No.  
333, Seq. ID No. 335, Seq. ID No. 337, Seq. ID No. 339, Seq. ID No. 343, Seq.  
ID No. 345, Seq. ID No. 347, Seq. ID No. 349, Seq. ID No. 353, Seq. ID No. 355,  
Seq. ID No. 357, Seq. ID No. 359, Seq. ID No. 361, Seq. ID No. 363, Seq. ID No.  
15 365, Seq. ID No. 367, Seq. ID No. 369, Seq. ID No. 371, Seq. ID No. 375, Seq.  
ID No. 377, Seq. ID No. 379, Seq. ID No. 383, Seq. ID No. 385, Seq. ID No. 387,  
Seq. ID No. 389, Seq. ID No. 391, Seq. ID No. 393, Seq. ID No. 397, Seq. ID No.  
401, Seq. ID No. 403, Seq. ID No. 405, Seq. ID No. 407, Seq. ID No. 409, Seq.  
ID No. 415, Seq. ID No. 423, Seq. ID No. 425, Seq. ID No. 427, Seq. ID No. 429,  
20 Seq. ID No. 431, Seq. ID No. 433, Seq. ID No. 435, Seq. ID No. 437, Seq. ID No.  
439, Seq. ID No. 441, Seq. ID No. 443, Seq. ID No. 445, Seq. ID No. 447, Seq.  
ID No. 451, Seq. ID No. 453, Seq. ID No. 455, Seq. ID No. 457, Seq. ID No. 461,  
Seq. ID No. 463, Seq. ID No. 467, Seq. ID No. 469, Seq. ID No. 471, Seq. ID No.  
473, Seq. ID No. 475, Seq. ID No. 477, Seq. ID No. 479, Seq. ID No. 481, Seq.  
25 ID No. 483, Seq. ID No. 485, Seq. ID No. 489, Seq. ID No. 491, Seq. ID No. 493,  
Seq. ID No. 495, Seq. ID No. 501, Seq. ID No. 505, Seq. ID No. 507, Seq. ID No.  
511, Seq. ID No. 515, Seq. ID No. 517, Seq. ID No. 523, Seq. ID No. 529, Seq.  
ID No. 531, Seq. ID No. 533, Seq. ID No. 537, Seq. ID No. 539, Seq. ID No. 543,  
Seq. ID No. 547, Seq. ID No. 549, Seq. ID No. 551, Seq. ID No. 553, Seq. ID No.  
30 555, Seq. ID No. 557, Seq. ID No. 559, Seq. ID No. 561, Seq. ID No. 565, Seq.  
ID No. 569, Seq. ID No. 571, Seq. ID No. 573, Seq. ID No. 575, Seq. ID No. 579,  
Seq. ID No. 581, Seq. ID No. 585, Seq. ID No. 587, Seq. ID No. 589, Seq. ID No.  
591, Seq. ID No. 593, Seq. ID No. 595, Seq. ID No. 597, Seq. ID No. 599, Seq.

5 ID No. 601, Seq. ID No. 603, Seq. ID No. 605, Seq. ID No. 609, Seq. ID No. 613,  
Seq. ID No. 615, Seq. ID No. 617, Seq. ID No. 619, Seq. ID No. 621, Seq. ID No.  
623, Seq. ID No. 625, Seq. ID No. 627, Seq. ID No. 635, Seq. ID No. 637, Seq.  
ID No. 643, Seq. ID No. 645, Seq. ID No. 647, Seq. ID No. 649, Seq. ID No. 655,  
Seq. ID No. 663, Seq. ID No. 665, Seq. ID No. 667, Seq. ID No. 669, Seq. ID No.  
10 675, Seq. ID No. 681, Seq. ID No. 683, Seq. ID No. 687, Seq. ID No. 689, Seq.  
ID No. 691, Seq. ID No. 695, Seq. ID No. 697, Seq. ID No. 699, Seq. ID No. 701,  
Seq. ID No. 703, Seq. ID No. 705, Seq. ID No. 707, Seq. ID No. 709, Seq. ID No.  
713, Seq. ID No. 725, Seq. ID No. 727, Seq. ID No. 729, Seq. ID No. 731, Seq.  
ID No. 733, Seq. ID No. 735, Seq. ID No. 739, Seq. ID No. 741, Seq. ID No. 745,  
Seq. ID No. 747, Seq. ID No. 749, Seq. ID No. 751, Seq. ID No. 753, Seq. ID No.  
759, Seq. ID No. 763, Seq. ID No. 765, Seq. ID No. 773, Seq. ID No. 775, Seq.  
ID No. 781, Seq. ID No. 783, Seq. ID No. 787, Seq. ID No. 793, Seq. ID No. 795,  
Seq. ID No. 799, Seq. ID No. 801, Seq. ID No. 805, Seq. ID No. 807, Seq. ID No.  
15 809, Seq. ID No. 811, Seq. ID No. 813, Seq. ID No. 815, Seq. ID No. 817, Seq.  
ID No. 819, Seq. ID No. 821, Seq. ID No. 823, Seq. ID No. 827, Seq. ID No. 829,  
Seq. ID No. 831, Seq. ID No. 835, Seq. ID No. 837, Seq. ID No. 839, Seq. ID No.  
843, Seq. ID No. 845, Seq. ID No. 847, Seq. ID No. 855, Seq. ID No. 859, Seq.  
ID No. 861, Seq. ID No. 865, Seq. ID No. 867, Seq. ID No. 871, Seq. ID No. 873,  
20 Seq. ID No. 875, Seq. ID No. 877, Seq. ID No. 879, Seq. ID No. 881, Seq. ID No.  
885, Seq. ID No. 895, Seq. ID No. 897, Seq. ID No. 899, Seq. ID No. 901, Seq.  
ID No. 903, Seq. ID No. 905, Seq. ID No. 907, Seq. ID No. 909, Seq. ID No. 913,  
Seq. ID No. 915, Seq. ID No. 921, Seq. ID No. 923, Seq. ID No. 925, Seq. ID No.  
931, Seq. ID No. 933, Seq. ID No. 935, Seq. ID No. 937, Seq. ID No. 939, Seq.  
25 ID No. 941, Seq. ID No. 943, Seq. ID No. 947, Seq. ID No. 949, Seq. ID No. 951,  
Seq. ID No. 953, Seq. ID No. 955, Seq. ID No. 957, Seq. ID No. 961, Seq. ID No.  
963, Seq. ID No. 965, Seq. ID No. 967, Seq. ID No. 969, Seq. ID No. 971, Seq.  
ID No. 973, Seq. ID No. 975, Seq. ID No. 981, Seq. ID No. 983, Seq. ID No. 985,  
Seq. ID No. 987, Seq. ID No. 989, Seq. ID No. 991, Seq. ID No. 993, Seq. ID No.  
30 995, Seq. ID No. 997, Seq. ID No. 1001, Seq. ID No. 1003, Seq. ID No. 1005,  
Seq. ID No. 1007, Seq. ID No. 1009, Seq. ID No. 1017, Seq. ID No. 1019, Seq.  
ID No. 1023, Seq. ID No. 1025, Seq. ID No. 1027, Seq. ID No. 1039, Seq. ID No.  
1041, Seq. ID No. 1043, Seq. ID No. 1045, Seq. ID No. 1047, Seq. ID No. 1049,

Seq. ID No. 1051, Seq. ID No. 1057, Seq. ID No. 1059, Seq. ID No. 1061, Seq.  
ID No. 1065, Seq. ID No. 1069, Seq. ID No. 1075, Seq. ID No. 1077, Seq. ID No.  
1079, Seq. ID No. 1081, Seq. ID No. 1083, Seq. ID No. 1085, Seq. ID No. 1087,  
Seq. ID No. 1091, Seq. ID No. 1093, Seq. ID No. 1095, Seq. ID No. 1097, Seq.  
5 ID No. 1099, Seq. ID No. 1101, Seq. ID No. 1103, Seq. ID No. 1107, Seq. ID No.  
1109, Seq. ID No. 1111, Seq. ID No. 1113, Seq. ID No. 1115, Seq. ID No. 1119,  
Seq. ID No. 1121, Seq. ID No. 1123, Seq. ID No. 1125, Seq. ID No. 1127, Seq.  
ID No. 1129, Seq. ID No. 1131, Seq. ID No. 1137, Seq. ID No. 1139, Seq. ID No.  
1141, Seq. ID No. 1143, Seq. ID No. 1145, Seq. ID No. 1147, Seq. ID No. 1149,  
10 Seq. ID No. 1151, Seq. ID No. 1153, Seq. ID No. 1155, Seq. ID No. 1157, Seq.  
ID No. 1159, Seq. ID No. 1161, Seq. ID No. 1163, Seq. ID No. 1171, Seq. ID No.  
1175, Seq. ID No. 1177, Seq. ID No. 1179, Seq. ID No. 1181, Seq. ID No. 1187,  
Seq. ID No. 1191, Seq. ID No. 1193, Seq. ID No. 1195, Seq. ID No. 1197, Seq.  
ID No. 1201, Seq. ID No. 1203, Seq. ID No. 1205, Seq. ID No. 1207, Seq. ID No.  
15 1211, Seq. ID No. 1213, Seq. ID No. 1215, Seq. ID No. 1217, Seq. ID No. 1221,  
Seq. ID No. 1223, Seq. ID No. 1225, Seq. ID No. 1231, Seq. ID No. 1233, Seq.  
ID No. 1237, Seq. ID No. 1239, Seq. ID No. 1241, Seq. ID No. 1245, Seq. ID No.  
1247, Seq. ID No. 1249, Seq. ID No. 1251, Seq. ID No. 1253, Seq. ID No. 1255,  
Seq. ID No. 1257, Seq. ID No. 1259, Seq. ID No. 1261, Seq. ID No. 1263, Seq.  
20 ID No. 1271, Seq. ID No. 1273, Seq. ID No. 1275, Seq. ID No. 1277, Seq. ID No.  
1279, Seq. ID No. 1285, Seq. ID No. 1289, Seq. ID No. 1291, Seq. ID No. 1293,  
Seq. ID No. 1295, Seq. ID No. 1297, Seq. ID No. 1299, Seq. ID No. 1301, Seq.  
ID No. 1303, Seq. ID No. 1305, Seq. ID No. 1307, Seq. ID No. 1309, Seq. ID No.  
1311, Seq. ID No. 1313, Seq. ID No. 1317, Seq. ID No. 1319, Seq. ID No. 1321,  
25 Seq. ID No. 1331, Seq. ID No. 1333, Seq. ID No. 1335, Seq. ID No. 1337, Seq.  
ID No. 1339, Seq. ID No. 1343, Seq. ID No. 1345, Seq. ID No. 1347, Seq. ID No.  
1349, Seq. ID No. 1351, Seq. ID No. 1359, Seq. ID No. 1361, Seq. ID No. 1363,  
Seq. ID No. 1365, Seq. ID No. 1369, Seq. ID No. 1371, Seq. ID No. 1375, Seq.  
ID No. 1377, Seq. ID No. 1381, Seq. ID No. 1383, Seq. ID No. 1385, Seq. ID No.  
30 1387, Seq. ID No. 1389, Seq. ID No. 1391, Seq. ID No. 1393, Seq. ID No. 1401,  
Seq. ID No. 1403, Seq. ID No. 1407, Seq. ID No. 1409, Seq. ID No. 1411, Seq.  
ID No. 1413, Seq. ID No. 1415, Seq. ID No. 1419, Seq. ID No. 1421, Seq. ID No.  
1423, Seq. ID No. 1425, Seq. ID No. 1427, Seq. ID No. 1429, Seq. ID No. 1433,

Seq. ID No. 1437, Seq. ID No. 1441, Seq. ID No. 1443, Seq. ID No. 1447, Seq.  
ID No. 1449, Seq. ID No. 1451, Seq. ID No. 1455, Seq. ID No. 1459, Seq. ID No.  
1463, Seq. ID No. 1465, Seq. ID No. 1467, Seq. ID No. 1469, Seq. ID No. 1471,  
Seq. ID No. 1473, Seq. ID No. 1475, Seq. ID No. 1477, Seq. ID No. 1479, Seq.  
5 ID No. 1483, Seq. ID No. 1485, Seq. ID No. 1487, Seq. ID No. 1491, Seq. ID No.  
1493, Seq. ID No. 1495, Seq. ID No. 1497, Seq. ID No. 1499, Seq. ID No. 1501,  
Seq. ID No. 1505, Seq. ID No. 1507, Seq. ID No. 1511, Seq. ID No. 1517, Seq.  
ID No. 1519, Seq. ID No. 1523, Seq. ID No. 1525, Seq. ID No. 1527, Seq. ID No.  
1531, Seq. ID No. 1539, Seq. ID No. 1543, Seq. ID No. 1549, Seq. ID No. 1551,  
10 Seq. ID No. 1553, Seq. ID No. 1555, Seq. ID No. 1557, Seq. ID No. 1561, Seq.  
ID No. 1563, Seq. ID No. 1565, Seq. ID No. 1567, Seq. ID No. 1571, Seq. ID No.  
1573, Seq. ID No. 1575, Seq. ID No. 1577, Seq. ID No. 1579, Seq. ID No. 1581,  
Seq. ID No. 1589, Seq. ID No. 1593, Seq. ID No. 1595, Seq. ID No. 1597, Seq.  
ID No. 1599, Seq. ID No. 1601, Seq. ID No. 1607, Seq. ID No. 1611, Seq. ID No.  
15 1613, Seq. ID No. 1615, Seq. ID No. 1617, Seq. ID No. 1619, Seq. ID No. 1623,  
Seq. ID No. 1625, Seq. ID No. 1627, Seq. ID No. 1633, Seq. ID No. 1637, Seq.  
ID No. 1639, Seq. ID No. 1641, Seq. ID No. 1643, Seq. ID No. 1647, Seq. ID No.  
1651, Seq. ID No. 1653, Seq. ID No. 1655, Seq. ID No. 1657, Seq. ID No. 1661,  
Seq. ID No. 1663, Seq. ID No. 1665, Seq. ID No. 1669, Seq. ID No. 1675, Seq.  
20 ID No. 1679, Seq. ID No. 1681, Seq. ID No. 1685, Seq. ID No. 1687, Seq. ID No.  
1689, Seq. ID No. 1691, Seq. ID No. 1693, Seq. ID No. 1695, Seq. ID No. 1697,  
Seq. ID No. 1699, Seq. ID No. 1703, Seq. ID No. 1705, Seq. ID No. 1707, Seq.  
ID No. 1711, Seq. ID No. 1713, Seq. ID No. 1715, Seq. ID No. 1717, Seq. ID No.  
1719, Seq. ID No. 1721, Seq. ID No. 1723, Seq. ID No. 1727, Seq. ID No. 1729,  
25 Seq. ID No. 1735, Seq. ID No. 1737, Seq. ID No. 1739, Seq. ID No. 1741, Seq.  
ID No. 1747, Seq. ID No. 1749, Seq. ID No. 1751, Seq. ID No. 1755, Seq. ID No.  
1757, Seq. ID No. 1759, Seq. ID No. 1763, Seq. ID No. 1769, Seq. ID No. 1771,  
Seq. ID No. 1775, Seq. ID No. 1777, Seq. ID No. 1779, Seq. ID No. 1781, Seq.  
ID No. 1783, Seq. ID No. 1785, Seq. ID No. 1789, Seq. ID No. 1791, Seq. ID No.  
30 1793, Seq. ID No. 1795, Seq. ID No. 1797, Seq. ID No. 1805, Seq. ID No. 1809,  
Seq. ID No. 1811, Seq. ID No. 1813, Seq. ID No. 1815, Seq. ID No. 1817, Seq.  
ID No. 1819, Seq. ID No. 1821, Seq. ID No. 1823, Seq. ID No. 1825, Seq. ID No.  
1829, Seq. ID No. 1833, Seq. ID No. 1841, Seq. ID No. 1843, Seq. ID No. 1845,

Seq. ID No. 1847, Seq. ID No. 1849, Seq. ID No. 1853, Seq. ID No. 1855, Seq.  
ID No. 1857, Seq. ID No. 1859, Seq. ID No. 1861, Seq. ID No. 1863, Seq. ID No.  
1865, Seq. ID No. 1867, Seq. ID No. 1871, Seq. ID No. 1873, Seq. ID No. 1875,  
Seq. ID No. 1877, Seq. ID No. 1881, Seq. ID No. 1883, Seq. ID No. 1885, Seq.  
5 ID No. 1887, Seq. ID No. 1889, Seq. ID No. 1895, Seq. ID No. 1903, Seq. ID No.  
1905, Seq. ID No. 1907, Seq. ID No. 1911, Seq. ID No. 1913, Seq. ID No. 1915,  
Seq. ID No. 1919, Seq. ID No. 1923, Seq. ID No. 1925, Seq. ID No. 1927, Seq.  
ID No. 1929, Seq. ID No. 1931, Seq. ID No. 1935, Seq. ID No. 1941, Seq. ID No.  
1943, Seq. ID No. 1945, Seq. ID No. 1947, Seq. ID No. 1949, Seq. ID No. 1951,  
10 Seq. ID No. 1953, Seq. ID No. 1959, Seq. ID No. 1961, Seq. ID No. 1963, Seq.  
ID No. 1965, Seq. ID No. 1967, Seq. ID No. 1969, Seq. ID No. 1971, Seq. ID No.  
1979, Seq. ID No. 1983, Seq. ID No. 1985, Seq. ID No. 1987, Seq. ID No. 1989,  
Seq. ID No. 1991, Seq. ID No. 1995, Seq. ID No. 1997, Seq. ID No. 1999, Seq.  
ID No. 2001, Seq. ID No. 2003, Seq. ID No. 2005, Seq. ID No. 2007, Seq. ID No.  
15 2015, Seq. ID No. 2019, Seq. ID No. 2021, Seq. ID No. 2025, Seq. ID No. 2027,  
Seq. ID No. 2029, Seq. ID No. 2031, Seq. ID No. 2035, Seq. ID No. 2037, Seq.  
ID No. 2041, Seq. ID No. 2043, Seq. ID No. 2045, Seq. ID No. 2047, Seq. ID No.  
2053, Seq. ID No. 2055, Seq. ID No. 2059, Seq. ID No. 2063, Seq. ID No. 2065,  
Seq. ID No. 2067, Seq. ID No. 2069, Seq. ID No. 2071, Seq. ID No. 2073, Seq.  
20 ID No. 2075, Seq. ID No. 2077, Seq. ID No. 2079, Seq. ID No. 2081, Seq. ID No.  
2083, Seq. ID No. 2085, Seq. ID No. 2089, Seq. ID No. 2091, Seq. ID No. 2093,  
Seq. ID No. 2097, Seq. ID No. 2099, Seq. ID No. 2101, Seq. ID No. 2103, Seq.  
ID No. 2107, Seq. ID No. 2109, Seq. ID No. 2111, Seq. ID No. 2115, Seq. ID No.  
2117, Seq. ID No. 2119, Seq. ID No. 2125, Seq. ID No. 2127, Seq. ID No. 2129,  
25 Seq. ID No. 2131, Seq. ID No. 2133, Seq. ID No. 2135, Seq. ID No. 2137, Seq.  
ID No. 2141, Seq. ID No. 2143, Seq. ID No. 2145, Seq. ID No. 2149, Seq. ID No.  
2151, Seq. ID No. 2153, Seq. ID No. 2155, Seq. ID No. 2157, Seq. ID No. 2159,  
Seq. ID No. 2161, Seq. ID No. 2165, Seq. ID No. 2167, Seq. ID No. 2169, Seq.  
ID No. 2179, Seq. ID No. 2181, Seq. ID No. 2183, Seq. ID No. 2189, Seq. ID No.  
30 2191, Seq. ID No. 2195, Seq. ID No. 2197, Seq. ID No. 2199, Seq. ID No. 2201,  
Seq. ID No. 2203, Seq. ID No. 2205, Seq. ID No. 2207, Seq. ID No. 2209, Seq.  
ID No. 2211, Seq. ID No. 2213, Seq. ID No. 2215, Seq. ID No. 2217, Seq. ID No.  
2221, Seq. ID No. 2223, Seq. ID No. 2227, Seq. ID No. 2229, Seq. ID No. 2235,

Seq. ID No. 2241, Seq. ID No. 2245, Seq. ID No. 2247, Seq. ID No. 2251, Seq.  
ID No. 2253, Seq. ID No. 2257, Seq. ID No. 2259, Seq. ID No. 2261, Seq. ID No.  
2263, Seq. ID No. 2265, Seq. ID No. 2267, Seq. ID No. 2269, Seq. ID No. 2275,  
Seq. ID No. 2277, Seq. ID No. 2279, Seq. ID No. 2285, Seq. ID No. 2287, Seq.  
5 ID No. 2297, Seq. ID No. 2299, Seq. ID No. 2301, Seq. ID No. 2309, Seq. ID No.  
2311, Seq. ID No. 2315, Seq. ID No. 2327, Seq. ID No. 2329, Seq. ID No. 2333,  
Seq. ID No. 2343, Seq. ID No. 2345, Seq. ID No. 2349, Seq. ID No. 2351, Seq.  
ID No. 2357, Seq. ID No. 2363, Seq. ID No. 2365, Seq. ID No. 2367, Seq. ID No.  
2369, Seq. ID No. 2371, Seq. ID No. 2373, Seq. ID No. 2375, Seq. ID No. 2379,  
10 Seq. ID No. 2381, Seq. ID No. 2385, Seq. ID No. 2387, Seq. ID No. 2391, Seq.  
ID No. 2393, Seq. ID No. 2395, Seq. ID No. 2397, Seq. ID No. 2399, Seq. ID No.  
2401, Seq. ID No. 2405, Seq. ID No. 2409, Seq. ID No. 2413, Seq. ID No. 2415,  
Seq. ID No. 2417, Seq. ID No. 2421, Seq. ID No. 2423, Seq. ID No. 2425, Seq.  
ID No. 2427, Seq. ID No. 2429, Seq. ID No. 2435, Seq. ID No. 2437, Seq. ID No.  
15 2445, Seq. ID No. 2447, Seq. ID No. 2449, Seq. ID No. 2451, Seq. ID No. 2453,  
Seq. ID No. 2455, Seq. ID No. 2457, Seq. ID No. 2459, Seq. ID No. 2461, Seq.  
ID No. 2463, Seq. ID No. 2465, Seq. ID No. 2469, Seq. ID No. 2471, Seq. ID No.  
2475, Seq. ID No. 2481, Seq. ID No. 2483, Seq. ID No. 2485, Seq. ID No. 2491,  
Seq. ID No. 2493, Seq. ID No. 2495, Seq. ID No. 2499, Seq. ID No. 2501, Seq.  
20 ID No. 2503, Seq. ID No. 2505, Seq. ID No. 2507, Seq. ID No. 2511, Seq. ID No.  
2513, Seq. ID No. 2517, Seq. ID No. 2519, Seq. ID No. 2521, Seq. ID No. 2525,  
Seq. ID No. 2529, Seq. ID No. 2533, Seq. ID No. 2535, Seq. ID No. 2537, Seq.  
ID No. 2539, Seq. ID No. 2547, Seq. ID No. 2549, Seq. ID No. 2551, Seq. ID No.  
2553, Seq. ID No. 2559, Seq. ID No. 2561, Seq. ID No. 2563, Seq. ID No. 2565,  
25 Seq. ID No. 2573, Seq. ID No. 2575, Seq. ID No. 2577, Seq. ID No. 2579, Seq.  
ID No. 2581, Seq. ID No. 2587, Seq. ID No. 2589, Seq. ID No. 2591, Seq. ID No.  
2593, Seq. ID No. 2595, Seq. ID No. 2599, Seq. ID No. 2603, Seq. ID No. 2605,  
Seq. ID No. 2607, Seq. ID No. 2609, Seq. ID No. 2611, Seq. ID No. 2613, Seq.  
ID No. 2617, Seq. ID No. 2619, Seq. ID No. 2623, Seq. ID No. 2625, Seq. ID No.  
30 2627, Seq. ID No. 2629, Seq. ID No. 2631, Seq. ID No. 2633, Seq. ID No. 2635,  
Seq. ID No. 2637, Seq. ID No. 2639, Seq. ID No. 2641, Seq. ID No. 2643, Seq.  
ID No. 2645, Seq. ID No. 2647, Seq. ID No. 2649, Seq. ID No. 2651, Seq. ID No.  
2653, Seq. ID No. 2655, Seq. ID No. 2659, Seq. ID No. 2663, Seq. ID No. 2667,



Seq. ID No. 2669, Seq. ID No. 2671, Seq. ID No. 2675, Seq. ID No. 2677, Seq.  
ID No. 2683, Seq. ID No. 2685, Seq. ID No. 2687, Seq. ID No. 2689, Seq. ID No.  
2691, Seq. ID No. 2693, Seq. ID No. 2695, Seq. ID No. 2697, Seq. ID No. 2699,  
Seq. ID No. 2703, Seq. ID No. 2709, Seq. ID No. 2711, Seq. ID No. 2715, Seq.  
5 ID No. 2717, Seq. ID No. 2719, Seq. ID No. 2723, Seq. ID No. 2725, Seq. ID No.  
2727, Seq. ID No. 2729, Seq. ID No. 2731, Seq. ID No. 2735, Seq. ID No. 2737,  
Seq. ID No. 2739, Seq. ID No. 2749, Seq. ID No. 2751, Seq. ID No. 2753, Seq.  
ID No. 2755, Seq. ID No. 2759, Seq. ID No. 2765, Seq. ID No. 2767, Seq. ID No.  
2769, Seq. ID No. 2771, Seq. ID No. 2773, Seq. ID No. 2775, Seq. ID No. 2779,  
10 Seq. ID No. 2781, Seq. ID No. 2783, Seq. ID No. 2787, Seq. ID No. 2789, Seq.  
ID No. 2791, Seq. ID No. 2793, Seq. ID No. 2795, Seq. ID No. 2797, Seq. ID No.  
2799, Seq. ID No. 2801, Seq. ID No. 2803, Seq. ID No. 2807, Seq. ID No. 2809,  
Seq. ID No. 2813, Seq. ID No. 2815, Seq. ID No. 2821, Seq. ID No. 2823, Seq.  
ID No. 2827, Seq. ID No. 2829, Seq. ID No. 2831, Seq. ID No. 2833, Seq. ID No.  
15 2839, Seq. ID No. 2841, Seq. ID No. 2843, Seq. ID No. 2845, Seq. ID No. 2847,  
Seq. ID No. 2855, Seq. ID No. 2861, Seq. ID No. 2863, Seq. ID No. 2865, Seq.  
ID No. 2867, Seq. ID No. 2869, Seq. ID No. 2871, Seq. ID No. 2877, Seq. ID No.  
2881, Seq. ID No. 2883, Seq. ID No. 2885, Seq. ID No. 2887, Seq. ID No. 2891,  
Seq. ID No. 2893, Seq. ID No. 2895, Seq. ID No. 2899, Seq. ID No. 2901, Seq.  
20 ID No. 2907, Seq. ID No. 2915, Seq. ID No. 2917, Seq. ID No. 2919, Seq. ID No.  
2921, Seq. ID No. 2923, Seq. ID No. 2927, Seq. ID No. 2931, Seq. ID No. 2933,  
Seq. ID No. 2935, Seq. ID No. 2943, Seq. ID No. 2945, Seq. ID No. 2951, Seq.  
ID No. 2953, Seq. ID No. 2957, Seq. ID No. 2959, Seq. ID No. 2961, Seq. ID No.  
2963, Seq. ID No. 2965, Seq. ID No. 2967, Seq. ID No. 2971, Seq. ID No. 2973,  
25 Seq. ID No. 2975, Seq. ID No. 2977, Seq. ID No. 2979, Seq. ID No. 2983, Seq.  
ID No. 2985, Seq. ID No. 2987, Seq. ID No. 2991, Seq. ID No. 2993, Seq. ID No.  
2999, Seq. ID No. 3001, Seq. ID No. 3005, Seq. ID No. 3009, Seq. ID No. 3011,  
Seq. ID No. 3015, Seq. ID No. 3017, Seq. ID No. 3019, Seq. ID No. 3021, Seq.  
ID No. 3027, Seq. ID No. 3033, Seq. ID No. 3035, Seq. ID No. 3037, Seq. ID No.  
30 3039, Seq. ID No. 3043, Seq. ID No. 3045, Seq. ID No. 3047, Seq. ID No. 3049,  
Seq. ID No. 3051, Seq. ID No. 3053, Seq. ID No. 3055, Seq. ID No. 3057, Seq.  
ID No. 3059, Seq. ID No. 3067, Seq. ID No. 3069, Seq. ID No. 3071, Seq. ID No.  
3079, Seq. ID No. 3083, Seq. ID No. 3085, Seq. ID No. 3087, Seq. ID No. 3091,

Seq. ID No. 3093, Seq. ID No. 3099, Seq. ID No. 3101, Seq. ID No. 3103, Seq.  
ID No. 3109, Seq. ID No. 3111, Seq. ID No. 3115, Seq. ID No. 3117, Seq. ID No.  
3119, Seq. ID No. 3121, Seq. ID No. 3123, Seq. ID No. 3125, Seq. ID No. 3129,  
Seq. ID No. 3131, Seq. ID No. 3133, Seq. ID No. 3135, Seq. ID No. 3137, Seq.  
5 ID No. 3139, Seq. ID No. 3141, Seq. ID No. 3143, Seq. ID No. 3147, Seq. ID No.  
3149, Seq. ID No. 3151, Seq. ID No. 3153, Seq. ID No. 3155, Seq. ID No. 3157,  
Seq. ID No. 3159, Seq. ID No. 3161, Seq. ID No. 3165, Seq. ID No. 3167, Seq.  
ID No. 3169, Seq. ID No. 3171, Seq. ID No. 3173, Seq. ID No. 3179, Seq. ID No.  
3181, Seq. ID No. 3183, Seq. ID No. 3185, Seq. ID No. 3187, Seq. ID No. 3189,  
10 Seq. ID No. 3191, Seq. ID No. 3193, Seq. ID No. 3195, Seq. ID No. 3197, Seq.  
ID No. 3203, Seq. ID No. 3205, Seq. ID No. 3207, Seq. ID No. 3209, Seq. ID No.  
3211, Seq. ID No. 3217, Seq. ID No. 3223, Seq. ID No. 3225, Seq. ID No. 3227,  
Seq. ID No. 3229, Seq. ID No. 3235, Seq. ID No. 3249, Seq. ID No. 3251, Seq.  
ID No. 3253, Seq. ID No. 3255, Seq. ID No. 3257, Seq. ID No. 3259, Seq. ID No.  
15 3263, Seq. ID No. 3265, Seq. ID No. 3269, Seq. ID No. 3271, Seq. ID No. 3273,  
Seq. ID No. 3277, Seq. ID No. 3281, Seq. ID No. 3283, Seq. ID No. 3285, Seq.  
ID No. 3289, Seq. ID No. 3291, Seq. ID No. 3293, Seq. ID No. 3299, Seq. ID No.  
3301, Seq. ID No. 3303, Seq. ID No. 3305, Seq. ID No. 3307, Seq. ID No. 3309,  
Seq. ID No. 3311, Seq. ID No. 3313, Seq. ID No. 3315, Seq. ID No. 3319, Seq.  
20 ID No. 3321, Seq. ID No. 3323, Seq. ID No. 3325, Seq. ID No. 3331, Seq. ID No.  
3335, Seq. ID No. 3337, Seq. ID No. 3339, Seq. ID No. 3341, Seq. ID No. 3345,  
Seq. ID No. 3347, Seq. ID No. 3349, Seq. ID No. 3353, Seq. ID No. 3355, Seq.  
ID No. 3359, Seq. ID No. 3361, Seq. ID No. 3363, Seq. ID No. 3365, Seq. ID No.  
3367, Seq. ID No. 3369, Seq. ID No. 3371, Seq. ID No. 3373, Seq. ID No. 3375,  
25 Seq. ID No. 3377, Seq. ID No. 3379, Seq. ID No. 3381, Seq. ID No. 3383, Seq.  
ID No. 3397, Seq. ID No. 3399, Seq. ID No. 3401, Seq. ID No. 3407, Seq. ID No.  
3409, Seq. ID No. 3413, Seq. ID No. 3415, Seq. ID No. 3419, Seq. ID No. 3425,  
Seq. ID No. 3427, Seq. ID No. 3431, Seq. ID No. 3433, Seq. ID No. 3435, Seq.  
ID No. 3439, Seq. ID No. 3441, Seq. ID No. 3443, Seq. ID No. 3445, Seq. ID No.  
30 3447, Seq. ID No. 3455, Seq. ID No. 3457, Seq. ID No. 3459, Seq. ID No. 3461,  
Seq. ID No. 3465, Seq. ID No. 3467, Seq. ID No. 3471, Seq. ID No. 3473, Seq.  
ID No. 3475, Seq. ID No. 3479, Seq. ID No. 3483, Seq. ID No. 3485, Seq. ID No.  
3487, Seq. ID No. 3489, Seq. ID No. 3495, Seq. ID No. 3497, Seq. ID No. 3499,

Seq. ID No. 3501, Seq. ID No. 3505, Seq. ID No. 3507, Seq. ID No. 3509, Seq.  
ID No. 3511, Seq. ID No. 3513, Seq. ID No. 3517, Seq. ID No. 3519, Seq. ID No.  
3521, Seq. ID No. 3525, Seq. ID No. 3529, Seq. ID No. 3531, Seq. ID No. 3533,  
Seq. ID No. 3535, Seq. ID No. 3537, Seq. ID No. 3539, Seq. ID No. 3541, Seq.  
5 ID No. 3543, Seq. ID No. 3545, Seq. ID No. 3547, Seq. ID No. 3549, Seq. ID No.  
3551, Seq. ID No. 3553, Seq. ID No. 3555, Seq. ID No. 3557, Seq. ID No. 3559,  
Seq. ID No. 3561, Seq. ID No. 3563, Seq. ID No. 3565, Seq. ID No. 3567, Seq.  
ID No. 3569, Seq. ID No. 3571, Seq. ID No. 3573, Seq. ID No. 3575, Seq. ID No.  
3579, Seq. ID No. 3581, Seq. ID No. 3583, Seq. ID No. 3587, Seq. ID No. 3589,  
10 Seq. ID No. 3595, Seq. ID No. 3597, Seq. ID No. 3599, Seq. ID No. 3603, Seq.  
ID No. 3605, Seq. ID No. 3607, Seq. ID No. 3609, Seq. ID No. 3611, Seq. ID No.  
3613, Seq. ID No. 3615, Seq. ID No. 3617, Seq. ID No. 3619, Seq. ID No. 3621,  
Seq. ID No. 3623, Seq. ID No. 3627, Seq. ID No. 3629, Seq. ID No. 3635, Seq.  
ID No. 3637, Seq. ID No. 3639, Seq. ID No. 3641, Seq. ID No. 3645, Seq. ID No.  
15 3647, Seq. ID No. 3649, Seq. ID No. 3651, Seq. ID No. 3653, Seq. ID No. 3657,  
Seq. ID No. 3659, Seq. ID No. 3663, Seq. ID No. 3665, Seq. ID No. 3667, Seq.  
ID No. 3671, Seq. ID No. 3673, Seq. ID No. 3675, Seq. ID No. 3677, Seq. ID No.  
3679, Seq. ID No. 3681, Seq. ID No. 3683, Seq. ID No. 3685, Seq. ID No. 3687,  
Seq. ID No. 3689, Seq. ID No. 3691, Seq. ID No. 3693, Seq. ID No. 3695, Seq.  
20 ID No. 3699, Seq. ID No. 3701, Seq. ID No. 3703, Seq. ID No. 3705, Seq. ID No.  
3707, Seq. ID No. 3709, Seq. ID No. 3713, Seq. ID No. 3715, Seq. ID No. 3717,  
Seq. ID No. 3727, Seq. ID No. 3729, Seq. ID No. 3733, Seq. ID No. 3737, Seq.  
ID No. 3739, Seq. ID No. 3741, Seq. ID No. 3745, Seq. ID No. 3747, Seq. ID No.  
3759, Seq. ID No. 3767, Seq. ID No. 3769, Seq. ID No. 3771, Seq. ID No. 3779,  
25 Seq. ID No. 3783, Seq. ID No. 3785, Seq. ID No. 3789, Seq. ID No. 3791, Seq.  
ID No. 3795, Seq. ID No. 3797, Seq. ID No. 3803, Seq. ID No. 3805, Seq. ID No.  
3807, Seq. ID No. 3809, Seq. ID No. 3811, Seq. ID No. 3813, Seq. ID No. 3815,  
Seq. ID No. 3817, Seq. ID No. 3819, Seq. ID No. 3823, Seq. ID No. 3825, Seq.  
ID No. 3831, Seq. ID No. 3833, Seq. ID No. 3835, Seq. ID No. 3841, Seq. ID No.  
30 3843, Seq. ID No. 3847, Seq. ID No. 3855, Seq. ID No. 3857, Seq. ID No. 3863,  
Seq. ID No. 3867, Seq. ID No. 3871, Seq. ID No. 3873, Seq. ID No. 3875, Seq.  
ID No. 3877, Seq. ID No. 3881, Seq. ID No. 3883, Seq. ID No. 3885, Seq. ID No.  
3893, Seq. ID No. 3895, Seq. ID No. 3899, Seq. ID No. 3901, Seq. ID No. 3905,

Seq. ID No. 3907, Seq. ID No. 3911, Seq. ID No. 3913, Seq. ID No. 3915, Seq.  
ID No. 3919, Seq. ID No. 3921, Seq. ID No. 3923, Seq. ID No. 3925, Seq. ID No.  
3927, Seq. ID No. 3929, Seq. ID No. 3931, Seq. ID No. 3933, Seq. ID No. 3935,  
Seq. ID No. 3939, Seq. ID No. 3941, Seq. ID No. 3943, Seq. ID No. 3945, Seq.  
5 ID No. 3947, Seq. ID No. 3949, Seq. ID No. 3951, Seq. ID No. 3953, Seq. ID No.  
3955, Seq. ID No. 3957, Seq. ID No. 3959, Seq. ID No. 3961, Seq. ID No. 3965,  
Seq. ID No. 3967, Seq. ID No. 3969, Seq. ID No. 3971, Seq. ID No. 3975, Seq.  
ID No. 3979, Seq. ID No. 3981, Seq. ID No. 3983, Seq. ID No. 3985, Seq. ID No.  
3987, Seq. ID No. 3991, Seq. ID No. 3995, Seq. ID No. 3997, Seq. ID No. 3999,  
10 Seq. ID No. 4003, Seq. ID No. 4007, Seq. ID No. 4009, Seq. ID No. 4015, Seq.  
ID No. 4017, Seq. ID No. 4021, Seq. ID No. 4023, Seq. ID No. 4029, Seq. ID No.  
4035, Seq. ID No. 4037, Seq. ID No. 4039, Seq. ID No. 4049, Seq. ID No. 4051,  
Seq. ID No. 4058, Seq. ID No. 4055, Seq. ID No. 4057, Seq. ID No. 4061, Seq.  
ID No. 4075, Seq. ID No. 4079, Seq. ID No. 4085, Seq. ID No. 4087, Seq. ID No.  
15 4089, Seq. ID No. 4091, Seq. ID No. 4093, Seq. ID No. 4095, Seq. ID No. 4099,  
Seq. ID No. 4105, Seq. ID No. 4107, Seq. ID No. 4109, Seq. ID No. 4111, Seq.  
ID No. 4113, Seq. ID No. 4117, Seq. ID No. 4119, Seq. ID No. 4121, Seq. ID No.  
4123, Seq. ID No. 4125, Seq. ID No. 4127, Seq. ID No. 4129, Seq. ID No. 4131,  
Seq. ID No. 4133, Seq. ID No. 4135, Seq. ID No. 4137, Seq. ID No. 4139, Seq.  
20 ID No. 4141, Seq. ID No. 4143, Seq. ID No. 4145, Seq. ID No. 4149, Seq. ID No.  
4153, Seq. ID No. 4155, Seq. ID No. 4157, Seq. ID No. 4161, Seq. ID No. 4163,  
Seq. ID No. 4167, Seq. ID No. 4171, Seq. ID No. 4173, Seq. ID No. 4175, Seq.  
ID No. 4177, Seq. ID No. 4179, Seq. ID No. 4181, Seq. ID No. 4185, Seq. ID No.  
4187, Seq. ID No. 4189, Seq. ID No. 4191, Seq. ID No. 4193, Seq. ID No. 4195,  
25 Seq. ID No. 4197, Seq. ID No. 4199, Seq. ID No. 4203, Seq. ID No. 4205, Seq.  
ID No. 4207, Seq. ID No. 4209, Seq. ID No. 4211, Seq. ID No. 4219, Seq. ID No.  
4229, Seq. ID No. 4233, Seq. ID No. 4235, Seq. ID No. 4237, Seq. ID No. 4239,  
Seq. ID No. 4243, Seq. ID No. 4249, Seq. ID No. 4251, Seq. ID No. 4253, Seq.  
ID No. 4255, Seq. ID No. 4259, Seq. ID No. 4263, Seq. ID No. 4265, Seq. ID No.  
30 4267, Seq. ID No. 4269, Seq. ID No. 4271, Seq. ID No. 4273, Seq. ID No. 4275,  
Seq. ID No. 4281, Seq. ID No. 4283, Seq. ID No. 4285, Seq. ID No. 4287, Seq.  
ID No. 4289, Seq. ID No. 4291, Seq. ID No. 4293, Seq. ID No. 4295, Seq. ID No.  
4297, Seq. ID No. 4299, Seq. ID No. 4301, Seq. ID No. 4303, Seq. ID No. 4307,

Seq. ID No. 4309, Seq. ID No. 4313, Seq. ID No. 4315, Seq. ID No. 4317, Seq.  
ID No. 4319, Seq. ID No. 4321, Seq. ID No. 4323, Seq. ID No. 4325, Seq. ID No.  
4329, Seq. ID No. 4331, Seq. ID No. 4333, Seq. ID No. 4335, Seq. ID No. 4337,  
Seq. ID No. 4339, Seq. ID No. 4343, Seq. ID No. 4345, Seq. ID No. 4347, Seq.  
5 ID No. 4351, Seq. ID No. 4353, Seq. ID No. 4355, Seq. ID No. 4359, Seq. ID No.  
4361, Seq. ID No. 4363, Seq. ID No. 4365, Seq. ID No. 4367, Seq. ID No. 4369,  
Seq. ID No. 4375, Seq. ID No. 4377, Seq. ID No. 4379, Seq. ID No. 4383, Seq.  
ID No. 4389, Seq. ID No. 4391, Seq. ID No. 4393, Seq. ID No. 4395, Seq. ID No.  
4397, Seq. ID No. 4399, Seq. ID No. 4401, Seq. ID No. 4403, Seq. ID No. 4405,  
10 Seq. ID No. 4407, Seq. ID No. 4409, Seq. ID No. 4411, Seq. ID No. 4413, Seq.  
ID No. 4415, Seq. ID No. 4417, Seq. ID No. 4419, Seq. ID No. 4421, Seq. ID No.  
4423, Seq. ID No. 4425, Seq. ID No. 4427, Seq. ID No. 4429, Seq. ID No. 4431,  
Seq. ID No. 4435, Seq. ID No. 4437, Seq. ID No. 4439, Seq. ID No. 4441, Seq.  
ID No. 4449, Seq. ID No. 4451, Seq. ID No. 4453, Seq. ID No. 4455, Seq. ID No.  
15 4457, Seq. ID No. 4459, Seq. ID No. 4461, Seq. ID No. 4465, Seq. ID No. 4467,  
Seq. ID No. 4471, Seq. ID No. 4475, Seq. ID No. 4477, Seq. ID No. 4479, Seq.  
ID No. 4481, Seq. ID No. 4485, Seq. ID No. 4487, Seq. ID No. 4489, Seq. ID No.  
4491, Seq. ID No. 4493, Seq. ID No. 4495, Seq. ID No. 4497, Seq. ID No. 4501,  
Seq. ID No. 4503, Seq. ID No. 4505, Seq. ID No. 4507, Seq. ID No. 4509, Seq.  
20 ID No. 4511, Seq. ID No. 4513, Seq. ID No. 4515, Seq. ID No. 4519, Seq. ID No.  
4521, Seq. ID No. 4523, Seq. ID No. 4525, Seq. ID No. 4527, Seq. ID No. 4529,  
Seq. ID No. 4531, Seq. ID No. 4533, Seq. ID No. 4537, Seq. ID No. 4541, Seq.  
ID No. 4545, Seq. ID No. 4547, Seq. ID No. 4549, Seq. ID No. 4551, Seq. ID No.  
4553, Seq. ID No. 4555, Seq. ID No. 4559, Seq. ID No. 4561, Seq. ID No. 4565,  
25 Seq. ID No. 4567, Seq. ID No. 4571, Seq. ID No. 4573, Seq. ID No. 4575, Seq.  
ID No. 4577, Seq. ID No. 4581, Seq. ID No. 4585, Seq. ID No. 4589, Seq. ID No.  
4591, Seq. ID No. 4597, Seq. ID No. 4599, Seq. ID No. 4601, Seq. ID No. 4603,  
Seq. ID No. 4605, Seq. ID No. 4607, Seq. ID No. 4609, Seq. ID No. 4611, Seq.  
ID No. 4613, Seq. ID No. 4615, Seq. ID No. 4617, Seq. ID No. 4619, Seq. ID No.  
30 4621, Seq. ID No. 4623, Seq. ID No. 4627, Seq. ID No. 4631, Seq. ID No. 4637,  
Seq. ID No. 4641, Seq. ID No. 4643, Seq. ID No. 4645, Seq. ID No. 4647, Seq.  
ID No. 4649, Seq. ID No. 4653, Seq. ID No. 4659, Seq. ID No. 4661, Seq. ID No.  
4663, Seq. ID No. 4665, Seq. ID No. 4667, Seq. ID No. 4669, Seq. ID No. 4671,

Seq. ID No. 4673, Seq. ID No. 4675, Seq. ID No. 4677, Seq. ID No. 4679, Seq.  
ID No. 4683, Seq. ID No. 4685, Seq. ID No. 4687, Seq. ID No. 4691, Seq. ID No.  
4693, Seq. ID No. 4695, Seq. ID No. 4699, Seq. ID No. 4701, Seq. ID No. 4703,  
Seq. ID No. 4705, Seq. ID No. 4713, Seq. ID No. 4717, Seq. ID No. 4719, Seq.  
5 ID No. 4721, Seq. ID No. 4727, Seq. ID No. 4729, Seq. ID No. 4733, Seq. ID No.  
4735, Seq. ID No. 4737, Seq. ID No. 4739, Seq. ID No. 4741, Seq. ID No. 4743,  
Seq. ID No. 4747, Seq. ID No. 4749, Seq. ID No. 4751, Seq. ID No. 4755, Seq.  
ID No. 4757, Seq. ID No. 4763, Seq. ID No. 4765, Seq. ID No. 4767, Seq. ID No.  
4769, Seq. ID No. 4773, Seq. ID No. 4775, Seq. ID No. 4777, Seq. ID No. 4779,  
10 Seq. ID No. 4781, Seq. ID No. 4787, Seq. ID No. 4789, Seq. ID No. 4791, Seq.  
ID No. 4793, Seq. ID No. 4795, Seq. ID No. 4797, Seq. ID No. 4801, Seq. ID No.  
4803, Seq. ID No. 4805, Seq. ID No. 4809, Seq. ID No. 4811, Seq. ID No. 4813,  
Seq. ID No. 4815, Seq. ID No. 4817, Seq. ID No. 4819, Seq. ID No. 4825, Seq.  
ID No. 4827, Seq. ID No. 4829, Seq. ID No. 4831, Seq. ID No. 4833, Seq. ID No.  
15 4837, Seq. ID No. 4839, Seq. ID No. 4841, Seq. ID No. 4843, Seq. ID No. 4845,  
Seq. ID No. 4849, Seq. ID No. 4851, Seq. ID No. 4853, Seq. ID No. 4855, Seq.  
ID No. 4861, Seq. ID No. 4863, Seq. ID No. 4867, Seq. ID No. 4875, Seq. ID No.  
4877, Seq. ID No. 4879, Seq. ID No. 4881, Seq. ID No. 4883, Seq. ID No. 4889,  
Seq. ID No. 4891, Seq. ID No. 4893, Seq. ID No. 4895, Seq. ID No. 4897, Seq.  
20 ID No. 4899, Seq. ID No. 4901, Seq. ID No. 4903, Seq. ID No. 4905, Seq. ID No.  
4907, Seq. ID No. 4909, Seq. ID No. 4911, Seq. ID No. 4913, Seq. ID No. 4915,  
Seq. ID No. 4917, Seq. ID No. 4919, Seq. ID No. 4921, Seq. ID No. 4923, Seq.  
ID No. 4927, Seq. ID No. 4931, Seq. ID No. 4935, Seq. ID No. 4937, Seq. ID No.  
4939, Seq. ID No. 4941, Seq. ID No. 4943, Seq. ID No. 4945, Seq. ID No. 4947,  
25 Seq. ID No. 4949, Seq. ID No. 4951, Seq. ID No. 4953, Seq. ID No. 4957, Seq.  
ID No. 4959, Seq. ID No. 4961, Seq. ID No. 4963, Seq. ID No. 4973, Seq. ID No.  
4975, Seq. ID No. 4977, Seq. ID No. 4979, Seq. ID No. 4981, Seq. ID No. 4983,  
Seq. ID No. 4985, Seq. ID No. 4987, Seq. ID No. 4989, Seq. ID No. 4991, Seq.  
ID No. 4993, Seq. ID No. 4995, Seq. ID No. 4997, Seq. ID No. 4999, Seq. ID No.  
30 5003, Seq. ID No. 5005, Seq. ID No. 5007, Seq. ID No. 5009, Seq. ID No. 5011,  
Seq. ID No. 5013, Seq. ID No. 5017, Seq. ID No. 5019, Seq. ID No. 5021, Seq.  
ID No. 5023, Seq. ID No. 5025, Seq. ID No. 5029, Seq. ID No. 5031, Seq. ID No.  
5033, Seq. ID No. 5035, Seq. ID No. 5041, Seq. ID No. 5043, Seq. ID No. 5045,

Seq. ID No. 5047, Seq. ID No. 5057, Seq. ID No. 5059, Seq. ID No. 5063, Seq.  
ID No. 5065, Seq. ID No. 5067, Seq. ID No. 5069, Seq. ID No. 5075, Seq. ID No.  
5077, Seq. ID No. 5079, Seq. ID No. 5081, Seq. ID No. 5083, Seq. ID No. 5085,  
Seq. ID No. 5087, Seq. ID No. 5091, Seq. ID No. 5099, Seq. ID No. 5101, Seq.  
5 ID No. 5103, Seq. ID No. 5109, Seq. ID No. 5111, Seq. ID No. 5113, Seq. ID No.  
5115, Seq. ID No. 5117, Seq. ID No. 5121, Seq. ID No. 5125, Seq. ID No. 5127,  
Seq. ID No. 5133, Seq. ID No. 5139, Seq. ID No. 5141, Seq. ID No. 5145, Seq.  
ID No. 5147, Seq. ID No. 5149, Seq. ID No. 5151, Seq. ID No. 5155, Seq. ID No.  
5157, Seq. ID No. 5159, Seq. ID No. 5161, Seq. ID No. 5165, Seq. ID No. 5167,  
10 Seq. ID No. 5169, Seq. ID No. 5177, Seq. ID No. 5181, Seq. ID No. 5183, Seq.  
ID No. 5185, Seq. ID No. 5187, Seq. ID No. 5189, Seq. ID No. 5191, Seq. ID No.  
5193, Seq. ID No. 5195, Seq. ID No. 5197, Seq. ID No. 5199, Seq. ID No. 5201,  
Seq. ID No. 5203, Seq. ID No. 5205, Seq. ID No. 5209, Seq. ID No. 5211, Seq.  
ID No. 5215, Seq. ID No. 5219, Seq. ID No. 5221, Seq. ID No. 5229, Seq. ID No.  
15 5231, Seq. ID No. 5239, Seq. ID No. 5241, Seq. ID No. 5243, Seq. ID No. 5245,  
Seq. ID No. 5251, Seq. ID No. 5253, Seq. ID No. 5255, Seq. ID No. 5261, Seq.  
ID No. 5263, Seq. ID No. 5265, Seq. ID No. 5267, Seq. ID No. 5277, Seq. ID No.  
5279, Seq. ID No. 5281, Seq. ID No. 5285, Seq. ID No. 5287, Seq. ID No. 5291,  
Seq. ID No. 5295, Seq. ID No. 5297, Seq. ID No. 5299, Seq. ID No. 5301, Seq.  
20 ID No. 5303, Seq. ID No. 5305, Seq. ID No. 5307, Seq. ID No. 5309, Seq. ID No.  
5311, Seq. ID No. 5313, Seq. ID No. 5317, Seq. ID No. 5319, Seq. ID No. 5321,  
Seq. ID No. 5323, Seq. ID No. 5327, Seq. ID No. 5329, Seq. ID No. 5331, Seq.  
ID No. 5333, Seq. ID No. 5335, Seq. ID No. 5337, Seq. ID No. 5343, Seq. ID No.  
5345, Seq. ID No. 5349, Seq. ID No. 5351, Seq. ID No. 5357, Seq. ID No. 5359,  
25 Seq. ID No. 5365, Seq. ID No. 5367, Seq. ID No. 5373, Seq. ID No. 5377, Seq.  
ID No. 5379, Seq. ID No. 5381, Seq. ID No. 5383, Seq. ID No. 5387, Seq. ID No.  
5389, Seq. ID No. 5391, Seq. ID No. 5393, Seq. ID No. 5397, Seq. ID No. 5399,  
Seq. ID No. 5401, Seq. ID No. 5403, Seq. ID No. 5405, Seq. ID No. 5407, Seq.  
ID No. 5409, Seq. ID No. 5411, Seq. ID No. 5415, Seq. ID No. 5417, Seq. ID No.  
30 5419, Seq. ID No. 5421, Seq. ID No. 5423, Seq. ID No. 5425, Seq. ID No. 5427,  
Seq. ID No. 5431, Seq. ID No. 5433, Seq. ID No. 5435, Seq. ID No. 5437, Seq.  
ID No. 5439, Seq. ID No. 5441, Seq. ID No. 5443, Seq. ID No. 5447, Seq. ID No.  
5449, Seq. ID No. 5451, Seq. ID No. 5453, Seq. ID No. 5455, Seq. ID No. 5457,

Seq. ID No. 5467, Seq. ID No. 5471, Seq. ID No. 5473, Seq. ID No. 5477, Seq.  
ID No. 5479, Seq. ID No. 5481, Seq. ID No. 5491, Seq. ID No. 5493, Seq. ID No.  
5495, Seq. ID No. 5499, Seq. ID No. 5503, Seq. ID No. 5509, Seq. ID No. 5513,  
Seq. ID No. 5515, Seq. ID No. 5517, Seq. ID No. 5519, Seq. ID No. 5521, Seq.  
5 ID No. 5527, Seq. ID No. 5529, Seq. ID No. 5531, Seq. ID No. 5533, Seq. ID No.  
5537, Seq. ID No. 5539, Seq. ID No. 5541, Seq. ID No. 5543, Seq. ID No. 5545,  
Seq. ID No. 5547, Seq. ID No. 5549, Seq. ID No. 5551, Seq. ID No. 5553, Seq.  
ID No. 5557, Seq. ID No. 5559, Seq. ID No. 5563, Seq. ID No. 5567, Seq. ID No.  
5569, Seq. ID No. 5575, Seq. ID No. 5577, Seq. ID No. 5581, Seq. ID No. 5583,  
10 Seq. ID No. 5585, Seq. ID No. 5589, Seq. ID No. 5591, Seq. ID No. 5593, Seq.  
ID No. 5595, Seq. ID No. 5599, Seq. ID No. 5601, Seq. ID No. 5607, Seq. ID No.  
5613, Seq. ID No. 5615, Seq. ID No. 5617, Seq. ID No. 5619, Seq. ID No. 5621,  
Seq. ID No. 5625, Seq. ID No. 5627, Seq. ID No. 5629, Seq. ID No. 5631, Seq.  
ID No. 5637, Seq. ID No. 5639, Seq. ID No. 5641, Seq. ID No. 5645, Seq. ID No.  
15 5647, Seq. ID No. 5649, Seq. ID No. 5651, Seq. ID No. 5655, Seq. ID No. 5657,  
Seq. ID No. 5661, Seq. ID No. 5665, Seq. ID No. 5667, Seq. ID No. 5669, Seq.  
ID No. 5677, Seq. ID No. 5679, Seq. ID No. 5683, Seq. ID No. 5685, Seq. ID No.  
5687, Seq. ID No. 5689, Seq. ID No. 5691, Seq. ID No. 5693, Seq. ID No. 5697,  
Seq. ID No. 5699, Seq. ID No. 5701, Seq. ID No. 5703, Seq. ID No. 5705, Seq.  
20 ID No. 5707, Seq. ID No. 5711, Seq. ID No. 5713, Seq. ID No. 5715, Seq. ID No.  
5717, Seq. ID No. 5719, Seq. ID No. 5721, Seq. ID No. 5723, Seq. ID No. 5725,  
Seq. ID No. 5727, Seq. ID No. 5735, Seq. ID No. 5739, Seq. ID No. 5741, Seq.  
ID No. 5743, Seq. ID No. 5745, Seq. ID No. 5747, Seq. ID No. 5749, Seq. ID No.  
5751, Seq. ID No. 5753, Seq. ID No. 5755, Seq. ID No. 5757, Seq. ID No. 5759,  
25 Seq. ID No. 5761, Seq. ID No. 5769, Seq. ID No. 5771, Seq. ID No. 5777, Seq.  
ID No. 5779, Seq. ID No. 5783, Seq. ID No. 5787, Seq. ID No. 5791, Seq. ID No.  
5795, Seq. ID No. 5799, Seq. ID No. 5801, Seq. ID No. 5807, Seq. ID No. 5809,  
Seq. ID No. 5813, Seq. ID No. 5815, Seq. ID No. 5819, Seq. ID No. 5821, Seq.  
ID No. 5823, Seq. ID No. 5825, Seq. ID No. 5827, Seq. ID No. 5829, Seq. ID No.  
30 5831, Seq. ID No. 5833, Seq. ID No. 5835, Seq. ID No. 5837, Seq. ID No. 5839,  
Seq. ID No. 5841, Seq. ID No. 5845, Seq. ID No. 5847, Seq. ID No. 5849, Seq.  
ID No. 5851, Seq. ID No. 5855, Seq. ID No. 5857, Seq. ID No. 5859, Seq. ID No.  
5861, Seq. ID No. 5863, Seq. ID No. 5865, Seq. ID No. 5869, Seq. ID No. 5871,



Seq. ID No. 5873, Seq. ID No. 5875, Seq. ID No. 5879, Seq. ID No. 5881, Seq.  
ID No. 5883, Seq. ID No. 5889, Seq. ID No. 5895, Seq. ID No. 5897, Seq. ID No.  
5901, Seq. ID No. 5903, Seq. ID No. 5911, Seq. ID No. 5913, Seq. ID No. 5915,  
Seq. ID No. 5917, Seq. ID No. 5919, Seq. ID No. 5927, Seq. ID No. 5929, Seq.  
5 ID No. 5933, Seq. ID No. 5935, Seq. ID No. 5937, Seq. ID No. 5941, Seq. ID No.  
5945, Seq. ID No. 5947, Seq. ID No. 5951, Seq. ID No. 5959, Seq. ID No. 5961,  
Seq. ID No. 5963, Seq. ID No. 5965, Seq. ID No. 5967, Seq. ID No. 5969, Seq.  
ID No. 5971, Seq. ID No. 5973, Seq. ID No. 5977, Seq. ID No. 5979, Seq. ID No.  
5981, Seq. ID No. 5985, Seq. ID No. 5987, Seq. ID No. 5989, Seq. ID No. 5991,  
10 Seq. ID No. 5993, Seq. ID No. 5995, Seq. ID No. 5999, Seq. ID No. 6001, Seq.  
ID No. 6003, Seq. ID No. 6009, Seq. ID No. 6011, Seq. ID No. 6013, Seq. ID No.  
6015, Seq. ID No. 6017, Seq. ID No. 6025, Seq. ID No. 6027, Seq. ID No. 6029,  
Seq. ID No. 6031, Seq. ID No. 6033, Seq. ID No. 6035, Seq. ID No. 6039, Seq.  
ID No. 6041, Seq. ID No. 6043, Seq. ID No. 6045, Seq. ID No. 6049, Seq. ID No.  
15 6051, Seq. ID No. 6053, Seq. ID No. 6055, Seq. ID No. 6057, Seq. ID No. 6061,  
Seq. ID No. 6063, Seq. ID No. 6065, Seq. ID No. 6069, Seq. ID No. 6071, Seq.  
ID No. 6073, Seq. ID No. 6077, Seq. ID No. 6079, Seq. ID No. 6085, Seq. ID No.  
6087, Seq. ID No. 6089, Seq. ID No. 6093, Seq. ID No. 6095, Seq. ID No. 6101,  
Seq. ID No. 6103, Seq. ID No. 6109, Seq. ID No. 6111, Seq. ID No. 6117, Seq.  
20 ID No. 6121, Seq. ID No. 6123, Seq. ID No. 6129, Seq. ID No. 6131, Seq. ID No.  
6133, Seq. ID No. 6135, Seq. ID No. 6137, Seq. ID No. 6139, Seq. ID No. 6141,  
Seq. ID No. 6145, Seq. ID No. 6151, Seq. ID No. 6155, Seq. ID No. 6157, Seq.  
ID No. 6159, Seq. ID No. 6165, Seq. ID No. 6167, Seq. ID No. 6169, Seq. ID No.  
6171, Seq. ID No. 6175, Seq. ID No. 6177, Seq. ID No. 6181, Seq. ID No. 6187,  
25 Seq. ID No. 6193, Seq. ID No. 6195, Seq. ID No. 6197, Seq. ID No. 6199, Seq.  
ID No. 6201, Seq. ID No. 6209, Seq. ID No. 6213, Seq. ID No. 6215, Seq. ID No.  
6217, Seq. ID No. 6219, Seq. ID No. 6231, Seq. ID No. 6233, Seq. ID No. 6235,  
Seq. ID No. 6239, Seq. ID No. 6241, Seq. ID No. 6243, Seq. ID No. 6249, Seq.  
ID No. 6257, Seq. ID No. 6259, Seq. ID No. 6261, Seq. ID No. 6263, Seq. ID No.  
30 6267, Seq. ID No. 6269, Seq. ID No. 6271, Seq. ID No. 6275, Seq. ID No. 6277,  
Seq. ID No. 6279, Seq. ID No. 6281, Seq. ID No. 6283, Seq. ID No. 6285, Seq.  
ID No. 6287, Seq. ID No. 6293, Seq. ID No. 6295, Seq. ID No. 6297, Seq. ID No.  
6299, Seq. ID No. 6305, Seq. ID No. 6309, Seq. ID No. 6311, Seq. ID No. 6315,

Seq. ID No. 6317, Seq. ID No. 6319, Seq. ID No. 6321, Seq. ID No. 6323, Seq. ID No. 6325, Seq. ID No. 6327, Seq. ID No. 6329, Seq. ID No. 6331, Seq. ID No. 6335, Seq. ID No. 6337, Seq. ID No. 6341, Seq. ID No. 6345, Seq. ID No. 6349, Seq. ID No. 6351, Seq. ID No. 6353, Seq. ID No. 6359, Seq. ID No. 6361, Seq. ID No. 6367, Seq. ID No. 6369, Seq. ID No. 6371, Seq. ID No. 6373, Seq. ID No. 6375, Seq. ID No. 6377, Seq. ID No. 6379, Seq. ID No. 6381, Seq. ID No. 6385, Seq. ID No. 6389, Seq. ID No. 6393, Seq. ID No. 6395, Seq. ID No. 6399, Seq. ID No. 6409, Seq. ID No. 6411, Seq. ID No. 6413, Seq. ID No. 6417, Seq. ID No. 6421, Seq. ID No. 6423, Seq. ID No. 6425, Seq. ID No. 6427, Seq. ID No. 6429, Seq. ID No. 6431, Seq. ID No. 6441, Seq. ID No. 6443, Seq. ID No. 6445, Seq. ID No. 6451, Seq. ID No. 6453, Seq. ID No. 6459, Seq. ID No. 6461, Seq. ID No. 6463, Seq. ID No. 6465, Seq. ID No. 6467, Seq. ID No. 6469, Seq. ID No. 6471, Seq. ID No. 6473, Seq. ID No. 6479, Seq. ID No. 6483, Seq. ID No. 6493, Seq. ID No. 6495, Seq. ID No. 6497, Seq. ID No. 6501, Seq. ID No. 6503, Seq. ID No. 6505, Seq. ID No. 6507, Seq. ID No. 6511, Seq. ID No. 6517, Seq. ID No. 6523, Seq. ID No. 6525, Seq. ID No. 6535, Seq. ID No. 6537, Seq. ID No. 6539, Seq. ID No. 6541, Seq. ID No. 6543, Seq. ID No. 6545, Seq. ID No. 6547, Seq. ID No. 6549, Seq. ID No. 6551, Seq. ID No. 6553, Seq. ID No. 6555, Seq. ID No. 6557, Seq. ID No. 6559, Seq. ID No. 6563, Seq. ID No. 6573, Seq. ID No. 6575, Seq. ID No. 6577, Seq. ID No. 6579, Seq. ID No. 6583, Seq. ID No. 6585, Seq. ID No. 6587, Seq. ID No. 6591, Seq. ID No. 6597, Seq. ID No. 6601, Seq. ID No. 6603, Seq. ID No. 6605, Seq. ID No. 6609, Seq. ID No. 6611, Seq. ID No. 6613, Seq. ID No. 6615, Seq. ID No. 6617, Seq. ID No. 6619, Seq. ID No. 6621, Seq. ID No. 6623, Seq. ID No. 6627, Seq. ID No. 6629, Seq. ID No. 6631, Seq. ID No. 6633, Seq. ID No. 6637, Seq. ID No. 6639, Seq. ID No. 6643, Seq. ID No. 6645, and Seq. ID No. 6649.

30. The polynucleotide of claim 7 wherein the polynucleotide encodes a polypeptide that is identified by an ORF finder program, which searches for a transmembrane domain between two Stop codons and a Start codon immediately upstream of this transmembrane region, and the polynucleotide is selected from one of Seq. ID No. 7, Seq. ID No. 9, Seq. ID No. 33, Seq. ID No. 47, Seq. ID No. 67, Seq. ID No. 85, Seq. ID No. 87, Seq. ID No. 123, Seq. ID No. 133, Seq. ID No. 141, Seq.

5 ID No. 159, Seq. ID No. 163, Seq. ID No. 191, Seq. ID No. 209, Seq. ID No. 211,  
Seq. ID No. 215, Seq. ID No. 217, Seq. ID No. 225, Seq. ID No. 235, Seq. ID No.  
237, Seq. ID No. 249, Seq. ID No. 251, Seq. ID No. 255, Seq. ID No. 271, Seq.  
ID No. 277, Seq. ID No. 285, Seq. ID No. 287, Seq. ID No. 289, Seq. ID No. 327,  
Seq. ID No. 329, Seq. ID No. 373, Seq. ID No. 375, Seq. ID No. 419, Seq. ID No.  
487, Seq. ID No. 497, Seq. ID No. 499, Seq. ID No. 503, Seq. ID No. 505, Seq.  
ID No. 509, Seq. ID No. 511, Seq. ID No. 515, Seq. ID No. 525, Seq. ID No. 527,  
Seq. ID No. 545, Seq. ID No. 567, Seq. ID No. 569, Seq. ID No. 575, Seq. ID No.  
577, Seq. ID No. 579, Seq. ID No. 593, Seq. ID No. 617, Seq. ID No. 637, Seq.  
10 ID No. 639, Seq. ID No. 641, Seq. ID No. 645, Seq. ID No. 653, Seq. ID No. 655,  
Seq. ID No. 659, Seq. ID No. 669, Seq. ID No. 675, Seq. ID No. 677, Seq. ID No.  
679, Seq. ID No. 715, Seq. ID No. 717, Seq. ID No. 719, Seq. ID No. 721, Seq.  
ID No. 723, Seq. ID No. 747, Seq. ID No. 751, Seq. ID No. 755, Seq. ID No. 757,  
Seq. ID No. 759, Seq. ID No. 761, Seq. ID No. 763, Seq. ID No. 769, Seq. ID No.  
15 777, Seq. ID No. 779, Seq. ID No. 807, Seq. ID No. 809, Seq. ID No. 819, Seq.  
ID No. 825, Seq. ID No. 863, Seq. ID No. 893, Seq. ID No. 901, Seq. ID No. 935,  
Seq. ID No. 943, Seq. ID No. 955, Seq. ID No. 967, Seq. ID No. 979, Seq. ID No.  
1005, Seq. ID No. 1009, Seq. ID No. 1011, Seq. ID No. 1013, Seq. ID No. 1015,  
Seq. ID No. 1019, Seq. ID No. 1029, Seq. ID No. 1031, Seq. ID No. 1033, Seq.  
20 ID No. 1037, Seq. ID No. 1039, Seq. ID No. 1045, Seq. ID No. 1055, Seq. ID No.  
1075, Seq. ID No. 1105, Seq. ID No. 1131, Seq. ID No. 1135, Seq. ID No. 1137,  
Seq. ID No. 1165, Seq. ID No. 1167, Seq. ID No. 1169, Seq. ID No. 1183, Seq.  
ID No. 1193, Seq. ID No. 1197, Seq. ID No. 1213, Seq. ID No. 1223, Seq. ID No.  
1227, Seq. ID No. 1229, Seq. ID No. 1237, Seq. ID No. 1243, Seq. ID No. 1265,  
25 Seq. ID No. 1267, Seq. ID No. 1269, Seq. ID No. 1271, Seq. ID No. 1283, Seq.  
ID No. 1287, Seq. ID No. 1291, Seq. ID No. 1297, Seq. ID No. 1305, Seq. ID No.  
1315, Seq. ID No. 1325, Seq. ID No. 1327, Seq. ID No. 1329, Seq. ID No. 1331,  
Seq. ID No. 1341, Seq. ID No. 1353, Seq. ID No. 1367, Seq. ID No. 1401, Seq.  
ID No. 1429, Seq. ID No. 1435, Seq. ID No. 1445, Seq. ID No. 1481, Seq. ID No.  
30 1513, Seq. ID No. 1515, Seq. ID No. 1517, Seq. ID No. 1529, Seq. ID No. 1533,  
Seq. ID No. 1535, Seq. ID No. 1545, Seq. ID No. 1547, Seq. ID No. 1551, Seq.  
ID No. 1559, Seq. ID No. 1563, Seq. ID No. 1571, Seq. ID No. 1579, Seq. ID No.  
1583, Seq. ID No. 1585, Seq. ID No. 1621, Seq. ID No. 1633, Seq. ID No. 1643,

Seq. ID No. 1645, Seq. ID No. 1647, Seq. ID No. 1649, Seq. ID No. 1653, Seq.  
ID No. 1671, Seq. ID No. 1673, Seq. ID No. 1677, Seq. ID No. 1681, Seq. ID No.  
1707, Seq. ID No. 1731, Seq. ID No. 1733, Seq. ID No. 1737, Seq. ID No. 1753,  
Seq. ID No. 1757, Seq. ID No. 1765, Seq. ID No. 1767, Seq. ID No. 1787, Seq.  
5 ID No. 1791, Seq. ID No. 1797, Seq. ID No. 1805, Seq. ID No. 1819, Seq. ID No.  
1821, Seq. ID No. 1823, Seq. ID No. 1839, Seq. ID No. 1869, Seq. ID No. 1875,  
Seq. ID No. 1891, Seq. ID No. 1893, Seq. ID No. 1895, Seq. ID No. 1923, Seq.  
ID No. 1927, Seq. ID No. 1969, Seq. ID No. 1981, Seq. ID No. 1991, Seq. ID No.  
1993, Seq. ID No. 2013, Seq. ID No. 2017, Seq. ID No. 2027, Seq. ID No. 2033,  
10 Seq. ID No. 2041, Seq. ID No. 2049, Seq. ID No. 2053, Seq. ID No. 2087, Seq.  
ID No. 2089, Seq. ID No. 2105, Seq. ID No. 2115, Seq. ID No. 2121, Seq. ID No.  
2127, Seq. ID No. 2151, Seq. ID No. 2159, Seq. ID No. 2171, Seq. ID No. 2173,  
Seq. ID No. 2177, Seq. ID No. 2187, Seq. ID No. 2237, Seq. ID No. 2239, Seq.  
ID No. 2245, Seq. ID No. 2249, Seq. ID No. 2271, Seq. ID No. 2283, Seq. ID No.  
15 2289, Seq. ID No. 2291, Seq. ID No. 2293, Seq. ID No. 2295, Seq. ID No. 2303,  
Seq. ID No. 2305, Seq. ID No. 2307, Seq. ID No. 2317, Seq. ID No. 2319, Seq.  
ID No. 2321, Seq. ID No. 2323, Seq. ID No. 2325, Seq. ID No. 2327, Seq. ID No.  
2333, Seq. ID No. 2343, Seq. ID No. 2347, Seq. ID No. 2349, Seq. ID No. 2351,  
Seq. ID No. 2353, Seq. ID No. 2355, Seq. ID No. 2357, Seq. ID No. 2365, Seq.  
20 ID No. 2389, Seq. ID No. 2391, Seq. ID No. 2407, Seq. ID No. 2419, Seq. ID No.  
2421, Seq. ID No. 2427, Seq. ID No. 2429, Seq. ID No. 2433, Seq. ID No. 2449,  
Seq. ID No. 2459, Seq. ID No. 2489, Seq. ID No. 2497, Seq. ID No. 2503, Seq.  
ID No. 2507, Seq. ID No. 2515, Seq. ID No. 2523, Seq. ID No. 2525, Seq. ID No.  
2531, Seq. ID No. 2535, Seq. ID No. 2537, Seq. ID No. 2541, Seq. ID No. 2543,  
25 Seq. ID No. 2545, Seq. ID No. 2555, Seq. ID No. 2557, Seq. ID No. 2569, Seq.  
ID No. 2571, Seq. ID No. 2583, Seq. ID No. 2591, Seq. ID No. 2597, Seq. ID No.  
2599, Seq. ID No. 2601, Seq. ID No. 2607, Seq. ID No. 2611, Seq. ID No. 2621,  
Seq. ID No. 2629, Seq. ID No. 2651, Seq. ID No. 2679, Seq. ID No. 2693, Seq.  
ID No. 2701, Seq. ID No. 2703, Seq. ID No. 2705, Seq. ID No. 2707, Seq. ID No.  
30 2731, Seq. ID No. 2733, Seq. ID No. 2783, Seq. ID No. 2785, Seq. ID No. 2813,  
Seq. ID No. 2815, Seq. ID No. 2823, Seq. ID No. 2835, Seq. ID No. 2837, Seq.  
ID No. 2841, Seq. ID No. 2853, Seq. ID No. 2873, Seq. ID No. 2875, Seq. ID No.  
2881, Seq. ID No. 2905, Seq. ID No. 2935, Seq. ID No. 2937, Seq. ID No. 2939,

Seq. ID No. 2941, Seq. ID No. 2947, Seq. ID No. 2949, Seq. ID No. 2969, Seq.  
ID No. 2973, Seq. ID No. 2977, Seq. ID No. 2981, Seq. ID No. 2987, Seq. ID No.  
2991, Seq. ID No. 2995, Seq. ID No. 2997, Seq. ID No. 3005, Seq. ID No. 3007,  
Seq. ID No. 3013, Seq. ID No. 3023, Seq. ID No. 3025, Seq. ID No. 3027, Seq.  
5 ID No. 3029, Seq. ID No. 3031, Seq. ID No. 3043, Seq. ID No. 3055, Seq. ID No.  
3063, Seq. ID No. 3071, Seq. ID No. 3073, Seq. ID No. 3075, Seq. ID No. 3077,  
Seq. ID No. 3123, Seq. ID No. 3145, Seq. ID No. 3155, Seq. ID No. 3157, Seq.  
ID No. 3163, Seq. ID No. 3183, Seq. ID No. 3193, Seq. ID No. 3201, Seq. ID No.  
3213, Seq. ID No. 3215, Seq. ID No. 3217, Seq. ID No. 3219, Seq. ID No. 3241,  
10 Seq. ID No. 3243, Seq. ID No. 3245, Seq. ID No. 3249, Seq. ID No. 3257, Seq.  
ID No. 3261, Seq. ID No. 3269, Seq. ID No. 3275, Seq. ID No. 3297, Seq. ID No.  
3317, Seq. ID No. 3323, Seq. ID No. 3337, Seq. ID No. 3339, Seq. ID No. 3349,  
Seq. ID No. 3351, Seq. ID No. 3353, Seq. ID No. 3357, Seq. ID No. 3359, Seq.  
ID No. 3377, Seq. ID No. 3389, Seq. ID No. 3391, Seq. ID No. 3395, Seq. ID No.  
15 3405, Seq. ID No. 3421, Seq. ID No. 3425, Seq. ID No. 3449, Seq. ID No. 3451,  
Seq. ID No. 3453, Seq. ID No. 3455, Seq. ID No. 3457, Seq. ID No. 3463, Seq.  
ID No. 3481, Seq. ID No. 3491, Seq. ID No. 3493, Seq. ID No. 3503, Seq. ID No.  
3505, Seq. ID No. 3527, Seq. ID No. 3593, Seq. ID No. 3595, Seq. ID No. 3621,  
Seq. ID No. 3625, Seq. ID No. 3635, Seq. ID No. 3679, Seq. ID No. 3723, Seq.  
20 ID No. 3727, Seq. ID No. 3745, Seq. ID No. 3753, Seq. ID No. 3755, Seq. ID No.  
3757, Seq. ID No. 3761, Seq. ID No. 3763, Seq. ID No. 3765, Seq. ID No. 3783,  
Seq. ID No. 3793, Seq. ID No. 3799, Seq. ID No. 3813, Seq. ID No. 3837, Seq.  
ID No. 3839, Seq. ID No. 3849, Seq. ID No. 3851, Seq. ID No. 3853, Seq. ID No.  
3859, Seq. ID No. 3861, Seq. ID No. 3863, Seq. ID No. 3865, Seq. ID No. 3879,  
25 Seq. ID No. 3889, Seq. ID No. 3891, Seq. ID No. 3903, Seq. ID No. 3925, Seq.  
ID No. 3963, Seq. ID No. 3973, Seq. ID No. 3975, Seq. ID No. 4005, Seq. ID No.  
4025, Seq. ID No. 4027, Seq. ID No. 4039, Seq. ID No. 4041, Seq. ID No. 4043,  
Seq. ID No. 4045, Seq. ID No. 4047, Seq. ID No. 4061, Seq. ID No. 4071, Seq.  
ID No. 4073, Seq. ID No. 4079, Seq. ID No. 4081, Seq. ID No. 4083, Seq. ID No.  
30 4101, Seq. ID No. 4103, Seq. ID No. 4111, Seq. ID No. 4133, Seq. ID No. 4137,  
Seq. ID No. 4139, Seq. ID No. 4145, Seq. ID No. 4151, Seq. ID No. 4221, Seq.  
ID No. 4223, Seq. ID No. 4225, Seq. ID No. 4227, Seq. ID No. 4231, Seq. ID No.  
4241, Seq. ID No. 4247, Seq. ID No. 4253, Seq. ID No. 4257, Seq. ID No. 4261,

Seq. ID No. 4307, Seq. ID No. 4311, Seq. ID No. 4313, Seq. ID No. 4343, Seq.  
ID No. 4379, Seq. ID No. 4385, Seq. ID No. 4389, Seq. ID No. 4439, Seq. ID No.  
4469, Seq. ID No. 4473, Seq. ID No. 4481, Seq. ID No. 4483, Seq. ID No. 4485,  
Seq. ID No. 4497, Seq. ID No. 4515, Seq. ID No. 4533, Seq. ID No. 4587, Seq.  
5 ID No. 4639, Seq. ID No. 4643, Seq. ID No. 4681, Seq. ID No. 4705, Seq. ID No.  
4707, Seq. ID No. 4709, Seq. ID No. 4711, Seq. ID No. 4715, Seq. ID No. 4717,  
Seq. ID No. 4737, Seq. ID No. 4759, Seq. ID No. 4813, Seq. ID No. 4827, Seq.  
ID No. 4869, Seq. ID No. 4871, Seq. ID No. 4873, Seq. ID No. 4875, Seq. ID No.  
4919, Seq. ID No. 4931, Seq. ID No. 4949, Seq. ID No. 4951, Seq. ID No. 4987,  
10 Seq. ID No. 5031, Seq. ID No. 5061, Seq. ID No. 5085, Seq. ID No. 5103, Seq.  
ID No. 5123, Seq. ID No. 5129, Seq. ID No. 5131, Seq. ID No. 5135, Seq. ID No.  
5137, Seq. ID No. 5141, Seq. ID No. 5165, Seq. ID No. 5175, Seq. ID No. 5199,  
Seq. ID No. 5205, Seq. ID No. 5207, Seq. ID No. 5213, Seq. ID No. 5219, Seq.  
ID No. 5223, Seq. ID No. 5267, Seq. ID No. 5281, Seq. ID No. 5385, Seq. ID No.  
15 5387, Seq. ID No. 5413, Seq. ID No. 5415, Seq. ID No. 5433, Seq. ID No. 5453,  
Seq. ID No. 5459, Seq. ID No. 5461, Seq. ID No. 5463, Seq. ID No. 5465, Seq.  
ID No. 5491, Seq. ID No. 5497, Seq. ID No. 5509, Seq. ID No. 5513, Seq. ID No.  
5525, Seq. ID No. 5531, Seq. ID No. 5569, Seq. ID No. 5587, Seq. ID No. 5595,  
Seq. ID No. 5597, Seq. ID No. 5609, Seq. ID No. 5611, Seq. ID No. 5621, Seq.  
20 ID No. 5623, Seq. ID No. 5633, Seq. ID No. 5637, Seq. ID No. 5643, Seq. ID No.  
5649, Seq. ID No. 5659, Seq. ID No. 5683, Seq. ID No. 5685, Seq. ID No. 5699,  
Seq. ID No. 5705, Seq. ID No. 5709, Seq. ID No. 5729, Seq. ID No. 5733, Seq.  
ID No. 5763, Seq. ID No. 5765, Seq. ID No. 5767, Seq. ID No. 5771, Seq. ID No.  
5783, Seq. ID No. 5791, Seq. ID No. 5797, Seq. ID No. 5885, Seq. ID No. 5889,  
25 Seq. ID No. 5893, Seq. ID No. 5895, Seq. ID No. 5899, Seq. ID No. 5901, Seq.  
ID No. 5905, Seq. ID No. 5909, Seq. ID No. 5921, Seq. ID No. 5923, Seq. ID No.  
5927, Seq. ID No. 5939, Seq. ID No. 6027, Seq. ID No. 6043, Seq. ID No. 6047,  
Seq. ID No. 6059, Seq. ID No. 6067, Seq. ID No. 6089, Seq. ID No. 6091, Seq.  
ID No. 6107, Seq. ID No. 6111, Seq. ID No. 6117, Seq. ID No. 6161, Seq. ID No.  
30 6163, Seq. ID No. 6165, Seq. ID No. 6169, Seq. ID No. 6183, Seq. ID No. 6185,  
Seq. ID No. 6189, Seq. ID No. 6191, Seq. ID No. 6197, Seq. ID No. 6203, Seq.  
ID No. 6205, Seq. ID No. 6209, Seq. ID No. 6221, Seq. ID No. 6223, Seq. ID No.  
6225, Seq. ID No. 6227, Seq. ID No. 6229, Seq. ID No. 6235, Seq. ID No. 6237,

- Seq. ID No. 6243, Seq. ID No. 6245, Seq. ID No. 6249, Seq. ID No. 6253, Seq. ID No. 6263, Seq. ID No. 6265, Seq. ID No. 6273, Seq. ID No. 6275, Seq. ID No. 6285, Seq. ID No. 6289, Seq. ID No. 6301, Seq. ID No. 6303, Seq. ID No. 6363, Seq. ID No. 6377, Seq. ID No. 6381, Seq. ID No. 6383, Seq. ID No. 6415, Seq. ID No. 6427, Seq. ID No. 6431, Seq. ID No. 6473, Seq. ID No. 6497, Seq. ID No. 6571, Seq. ID No. 6581, Seq. ID No. 6593, Seq. ID No. 6599, Seq. ID No. 6631, and Seq. ID No. 6639.
31. An isolated polynucleotide of an *Alloiococcus otitidis* genomic sequence, wherein the polynucleotide comprises a nucleotide sequence having at least about 70% identity to a nucleotide sequence contained within SEQ ID NO: 6651, a complement thereof, a degenerate variant thereof, and a fragment thereof.
32. An isolated polypeptide encoded by a polynucleotide comprising a nucleotide sequence having at least about 70% identity to a nucleotide sequence selected from one of odd numbered sequences from SEQ ID NO: 1 to SEQ ID NO: 6649, a degenerate variant thereof, and a fragment thereof.
33. The polypeptide of claim 32, wherein the polypeptide comprises an amino acid sequence having at least about 70% identity to an amino acid sequence chosen from one of the even-numbered sequences from SEQ ID NO: 2 to SEQ ID NO: 6650, a biological equivalent thereof, and a fragment thereof.
34. The polypeptide of claim 32, wherein the polypeptide is a fusion polypeptide.
35. The polypeptide of claim 32, which immunoreacts with seropositive serum of an individual infected with *Alloiococcus otitidis*.
36. The polypeptide of claim 32, further defined as:
- (a) an *Alloiococcus otitidis* polypeptide predicted by SignalP algorithm analysis as having met all four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and predicted by HMM Signal P algorithm analysis as having a signal peptide;

- (b) an *Alloiococcus otitidis* polypeptide predicted by SignalP algorithm analysis as having met three of the four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and predicted by HMM SignalP algorithm analysis as having a signal peptide;
- 5 (c) an *Alloiococcus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as having a signal peptide;
- (d) an *Alloiococcus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as being a non-secretory protein;
- (e) an *Alloiococcus otitidis* polypeptide identified by BlastP analysis;
- 10 (f) an *Alloiococcus otitidis* polypeptide identified by Pfam analysis;
- (g) an *Alloiococcus otitidis* polypeptide identified using proteomics methodology as sharing homology with surface exposed proteins of *Streptococcus pneumoniae*;
- (h) an *Alloiococcus otitidis* lipoprotein;
- 15 (i) an *Alloiococcus otitidis* polypeptide having a LPXTG motif, wherein the polypeptide is covalently attached to the peptidoglycan layer;
- (j) an *Alloiococcus otitidis* polypeptide, wherein the polypeptide is non-covalently associated with the peptidoglycan layer;
- (k) an *Alloiococcus otitidis* polypeptide having an RGD<sub>X</sub> motif wherein X is not a proline residue;
- 20 (l) an *Alloiococcus otitidis* polypeptide predicted by BlastP as being involved in capsule biosynthesis and transport;
- (m) an *Alloiococcus otitidis* polypeptide identified by BlastP as being localized within the capsule loci of the *Alloiococcus otitidis* genome;
- 25 (n) an *Alloiococcus otitidis* polypeptide predicted by BlastP as being associated with sporulation;
- (o) an *Alloiococcus otitidis* polypeptide encoded by unique ORFs identified by BlastP analysis as having a BlastP 'E Value' of  $> e^{-10}$ ;
- (p) an *Alloiococcus otitidis* polypeptide identified by Glimmer™ ORF finder program;
- 30 (q) an *Alloiococcus otitidis* polypeptide identified by GeneMark™ ORF finder program;



- (r) an *Alloiococcus otitidis* polypeptide identified by an ORF finder program that searches for an ATG, GTG or TTG Start codon between a Stop-Stop region; and
- (s) an *Alloiococcus otitidis* polypeptide identified by an ORF finder program that searches for a transmembrane domain between two Stop codon and a Start codon immediately upstream of this transmembrane region.

37. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is predicted by SignalP algorithm analysis as having met all four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and predicted by HMM Signal P algorithm analysis as having a signal peptide; and is selected from one of Seq. ID No. 90, Seq. ID No. 128, Seq. ID No. 132, Seq. ID No. 134, Seq. ID No. 162, Seq. ID No. 164, Seq. ID No. 214, Seq. ID No. 216, Seq. ID No. 226, Seq. ID No. 250, Seq. ID No. 252, Seq. ID No. 288, Seq. ID No. 290, Seq. ID No. 370, Seq. ID No. 372, Seq. ID No. 376, Seq. ID No. 378, Seq. ID No. 498, Seq. ID No. 504, Seq. ID No. 506, Seq. ID No. 528, Seq. ID No. 550, Seq. ID No. 576, Seq. ID No. 618, Seq. ID No. 658, Seq. ID No. 660, Seq. ID No. 662, Seq. ID No. 676, Seq. ID No. 716, Seq. ID No. 718, Seq. ID No. 746, Seq. ID No. 748, Seq. ID No. 756, Seq. ID No. 758, Seq. ID No. 760, Seq. ID No. 762, Seq. ID No. 774, Seq. ID No. 808, Seq. ID No. 968, Seq. ID No. 974, Seq. ID No. 976, Seq. ID No. 1014, Seq. ID No. 1026, Seq. ID No. 1028, Seq. ID No. 1040, Seq. ID No. 1076, Seq. ID No. 1090, Seq. ID No. 1196, Seq. ID No. 1198, Seq. ID No. 1208, Seq. ID No. 1240, Seq. ID No. 1244, Seq. ID No. 1246, Seq. ID No. 1270, Seq. ID No. 1316, Seq. ID No. 1318, Seq. ID No. 1332, Seq. ID No. 1366, Seq. ID No. 1368, Seq. ID No. 1370, Seq. ID No. 1446, Seq. ID No. 1448, Seq. ID No. 1514, Seq. ID No. 1518, Seq. ID No. 1546, Seq. ID No. 1550, Seq. ID No. 1562, Seq. ID No. 1570, Seq. ID No. 1572, Seq. ID No. 1586, Seq. ID No. 1644, Seq. ID No. 1654, Seq. ID No. 1662, Seq. ID No. 1664, Seq. ID No. 1708, Seq. ID No. 1734, Seq. ID No. 1738, Seq. ID No. 1756, Seq. ID No. 1766, Seq. ID No. 1768, Seq. ID No. 1776, Seq. ID No. 1792, Seq. ID No. 1806, Seq. ID No. 1876, Seq. ID No. 1970, Seq. ID No. 1982, Seq. ID No. 2054, Seq. ID No. 2056, Seq. ID No. 2088, Seq. ID No. 2090, Seq. ID No. 2092, Seq. ID No. 2106, Seq. ID No. 2116, Seq. ID No. 2150, Seq. ID No. 2152, Seq. ID No. 2160, Seq. ID No. 2178, Seq. ID No. 2278,

Seq. ID No. 2294, Seq. ID No. 2322, Seq. ID No. 2348, Seq. ID No. 2352, Seq.  
ID No. 2354, Seq. ID No. 2366, Seq. ID No. 2396, Seq. ID No. 2422, Seq. ID No.  
2426, Seq. ID No. 2428, Seq. ID No. 2430, Seq. ID No. 2450, Seq. ID No. 2460,  
Seq. ID No. 2526, Seq. ID No. 2532, Seq. ID No. 2608, Seq. ID No. 2652, Seq.  
5 ID No. 2680, Seq. ID No. 2694, Seq. ID No. 2700, Seq. ID No. 2704, Seq. ID No.  
2754, Seq. ID No. 2786, Seq. ID No. 2814, Seq. ID No. 2830, Seq. ID No. 2836,  
Seq. ID No. 2842, Seq. ID No. 2880, Seq. ID No. 2882, Seq. ID No. 2936, Seq.  
ID No. 2938, Seq. ID No. 2950, Seq. ID No. 2966, Seq. ID No. 2968, Seq. ID No.  
2974, Seq. ID No. 3008, Seq. ID No. 3010, Seq. ID No. 3012, Seq. ID No. 3030,  
10 Seq. ID No. 3032, Seq. ID No. 3110, Seq. ID No. 3112, Seq. ID No. 3220, Seq.  
ID No. 3224, Seq. ID No. 3274, Seq. ID No. 3298, Seq. ID No. 3332, Seq. ID No.  
3336, Seq. ID No. 3342, Seq. ID No. 3350, Seq. ID No. 3354, Seq. ID No. 3356,  
Seq. ID No. 3378, Seq. ID No. 3392, Seq. ID No. 3426, Seq. ID No. 3450, Seq.  
ID No. 3494, Seq. ID No. 3574, Seq. ID No. 3612, Seq. ID No. 3620, Seq. ID No.  
15 3690, Seq. ID No. 3754, Seq. ID No. 3756, Seq. ID No. 3766, Seq. ID No. 3782,  
Seq. ID No. 3784, Seq. ID No. 3852, Seq. ID No. 3904, Seq. ID No. 4006, Seq.  
ID No. 4008, Seq. ID No. 4028, Seq. ID No. 4074, Seq. ID No. 4138, Seq. ID No.  
4142, Seq. ID No. 4144, Seq. ID No. 4146, Seq. ID No. 4226, Seq. ID No. 4344,  
Seq. ID No. 4386, Seq. ID No. 4400, Seq. ID No. 4470, Seq. ID No. 4484, Seq.  
20 ID No. 4494, Seq. ID No. 4496, Seq. ID No. 4534, Seq. ID No. 4700, Seq. ID No.  
4710, Seq. ID No. 4712, Seq. ID No. 4736, Seq. ID No. 4828, Seq. ID No. 4872,  
Seq. ID No. 4874, Seq. ID No. 4880, Seq. ID No. 4922, Seq. ID No. 4982, Seq.  
ID No. 5116, Seq. ID No. 5268, Seq. ID No. 5342, Seq. ID No. 5388, Seq. ID No.  
5466, Seq. ID No. 5468, Seq. ID No. 5480, Seq. ID No. 5498, Seq. ID No. 5514,  
25 Seq. ID No. 5544, Seq. ID No. 5546, Seq. ID No. 5568, Seq. ID No. 5588, Seq.  
ID No. 5590, Seq. ID No. 5592, Seq. ID No. 5612, Seq. ID No. 5622, Seq. ID No.  
5642, Seq. ID No. 5682, Seq. ID No. 5720, Seq. ID No. 5772, Seq. ID No. 5784,  
Seq. ID No. 5896, Seq. ID No. 5900, Seq. ID No. 5902, Seq. ID No. 5928, Seq.  
ID No. 5930, Seq. ID No. 5940, Seq. ID No. 5988, Seq. ID No. 6014, Seq. ID No.  
30 6088, Seq. ID No. 6090, Seq. ID No. 6092, Seq. ID No. 6094, Seq. ID No. 6096,  
Seq. ID No. 6104, Seq. ID No. 6170, Seq. ID No. 6186, Seq. ID No. 6188, Seq.  
ID No. 6196, Seq. ID No. 6198, Seq. ID No. 6204, Seq. ID No. 6206, Seq. ID No.  
6222, Seq. ID No. 6224, Seq. ID No. 6230, Seq. ID No. 6292, Seq. ID No. 6416,

Seq. ID No. 6418, Seq. ID No. 6474, Seq. ID No. 6508, Seq. ID No. 6544, Seq. ID No. 6596, Seq. ID No. 6598, Seq. ID No. 6600, Seq. ID No. 6602, and Seq. ID No. 6604.

- 5 38. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is predicted by SignalP algorithm analysis as having met three of the four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and predicted by HMM SignalP algorithm analysis as having a signal peptide; and is selected from one of Seq. ID No. 8, Seq. ID No. 12, Seq. ID No. 24, Seq. ID No. 10 46, Seq. ID No. 48, Seq. ID No. 54, Seq. ID No. 60, Seq. ID No. 66, Seq. ID No. 68, Seq. ID No. 88, Seq. ID No. 92, Seq. ID No. 140, Seq. ID No. 152, Seq. ID No. 160, Seq. ID No. 166, Seq. ID No. 170, Seq. ID No. 186, Seq. ID No. 212, Seq. ID No. 218, Seq. ID No. 236, Seq. ID No. 238, Seq. ID No. 240, Seq. ID No. 272, Seq. ID No. 286, Seq. ID No. 292, Seq. ID No. 328, Seq. ID No. 350, Seq. 15 ID No. 386, Seq. ID No. 388, Seq. ID No. 408, Seq. ID No. 428, Seq. ID No. 432, Seq. ID No. 456, Seq. ID No. 458, Seq. ID No. 496, Seq. ID No. 500, Seq. ID No. 512, Seq. ID No. 514, Seq. ID No. 516, Seq. ID No. 526, Seq. ID No. 546, Seq. ID No. 548, Seq. ID No. 558, Seq. ID No. 570, Seq. ID No. 590, Seq. ID No. 592, Seq. ID No. 594, Seq. ID No. 596, Seq. ID No. 610, Seq. ID No. 638, Seq. ID No. 20 640, Seq. ID No. 642, Seq. ID No. 654, Seq. ID No. 670, Seq. ID No. 680, Seq. ID No. 720, Seq. ID No. 724, Seq. ID No. 740, Seq. ID No. 750, Seq. ID No. 752, Seq. ID No. 764, Seq. ID No. 766, Seq. ID No. 770, Seq. ID No. 778, Seq. ID No. 780, Seq. ID No. 782, Seq. ID No. 820, Seq. ID No. 896, Seq. ID No. 904, Seq. ID No. 906, Seq. ID No. 910, Seq. ID No. 936, Seq. ID No. 938, Seq. ID No. 952, 25 Seq. ID No. 956, Seq. ID No. 980, Seq. ID No. 982, Seq. ID No. 984, Seq. ID No. 986, Seq. ID No. 1006, Seq. ID No. 1008, Seq. ID No. 1010, Seq. ID No. 1016, Seq. ID No. 1020, Seq. ID No. 1030, Seq. ID No. 1032, Seq. ID No. 1048, Seq. ID No. 1092, Seq. ID No. 1112, Seq. ID No. 1138, Seq. ID No. 1152, Seq. ID No. 1154, Seq. ID No. 1170, Seq. ID No. 1174, Seq. ID No. 1184, Seq. ID No. 1192, 30 Seq. ID No. 1194, Seq. ID No. 1214, Seq. ID No. 1224, Seq. ID No. 1230, Seq. ID No. 1248, Seq. ID No. 1260, Seq. ID No. 1284, Seq. ID No. 1308, Seq. ID No. 1320, Seq. ID No. 1322, Seq. ID No. 1328, Seq. ID No. 1342, Seq. ID No. 1344, Seq. ID No. 1348, Seq. ID No. 1390, Seq. ID No. 1402, Seq. ID No. 1430, Seq.

5 ID No. 1480, Seq. ID No. 1552, Seq. ID No. 1560, Seq. ID No. 1580, Seq. ID No. 1588, Seq. ID No. 1622, Seq. ID No. 1628, Seq. ID No. 1634, Seq. ID No. 1646, Seq. ID No. 1648, Seq. ID No. 1650, Seq. ID No. 1656, Seq. ID No. 1666, Seq. ID No. 1668, Seq. ID No. 1672, Seq. ID No. 1678, Seq. ID No. 1680, Seq. ID No. 1682, Seq. ID No. 1696, Seq. ID No. 1704, Seq. ID No. 1706, Seq. ID No. 1732, Seq. ID No. 1754, Seq. ID No. 1760, Seq. ID No. 1764, Seq. ID No. 1788, Seq. ID No. 1798, Seq. ID No. 1822, Seq. ID No. 1824, Seq. ID No. 1834, Seq. ID No. 1840, Seq. ID No. 1842, Seq. ID No. 1844, Seq. ID No. 1894, Seq. ID No. 1918, Seq. ID No. 1920, Seq. ID No. 1972, Seq. ID No. 1992, Seq. ID No. 2014, Seq. ID No. 2016, Seq. ID No. 2018, Seq. ID No. 2020, Seq. ID No. 2034, Seq. ID No. 2036, Seq. ID No. 2050, Seq. ID No. 2082, Seq. ID No. 2084, Seq. ID No. 2086, Seq. ID No. 2112, Seq. ID No. 2114, Seq. ID No. 2124, Seq. ID No. 2126, Seq. ID No. 2128, Seq. ID No. 2132, Seq. ID No. 2134, Seq. ID No. 2154, Seq. ID No. 2162, Seq. ID No. 2172, Seq. ID No. 2176, Seq. ID No. 2180, Seq. ID No. 2188, Seq. ID No. 2202, Seq. ID No. 2204, Seq. ID No. 2222, Seq. ID No. 2238, Seq. ID No. 2250, Seq. ID No. 2252, Seq. ID No. 2256, Seq. ID No. 2262, Seq. ID No. 2264, Seq. ID No. 2272, Seq. ID No. 2280, Seq. ID No. 2284, Seq. ID No. 2286, Seq. ID No. 2290, Seq. ID No. 2296, Seq. ID No. 2306, Seq. ID No. 2308, Seq. ID No. 2318, Seq. ID No. 2320, Seq. ID No. 2324, Seq. ID No. 2326, Seq. ID No. 2344, Seq. ID No. 2350, Seq. ID No. 2386, Seq. ID No. 2394, Seq. ID No. 2424, Seq. ID No. 2454, Seq. ID No. 2492, Seq. ID No. 2498, Seq. ID No. 2500, Seq. ID No. 2508, Seq. ID No. 2516, Seq. ID No. 2518, Seq. ID No. 2522, Seq. ID No. 2524, Seq. ID No. 2528, Seq. ID No. 2534, Seq. ID No. 2536, Seq. ID No. 2542, Seq. ID No. 2544, Seq. ID No. 2548, Seq. ID No. 2550, Seq. ID No. 2558, Seq. ID No. 2574, Seq. ID No. 2584, Seq. ID No. 2602, Seq. ID No. 2604, Seq. ID No. 2622, Seq. ID No. 2654, Seq. ID No. 2682, Seq. ID No. 2692, Seq. ID No. 2702, Seq. ID No. 2734, Seq. ID No. 2740, Seq. ID No. 2802, Seq. ID No. 2808, Seq. ID No. 2816, Seq. ID No. 2820, Seq. ID No. 2822, Seq. ID No. 2824, Seq. ID No. 2834, Seq. ID No. 2838, Seq. ID No. 2840, Seq. ID No. 2846, Seq. ID No. 2854, Seq. ID No. 2862, Seq. ID No. 2866, Seq. ID No. 2874, Seq. ID No. 2876, Seq. ID No. 2878, Seq. ID No. 2884, Seq. ID No. 2896, Seq. ID No. 2906, Seq. ID No. 2940, Seq. ID No. 2942, Seq. ID No. 2948, Seq. ID No. 2982, Seq. ID No. 2984, Seq. ID No. 2988, Seq. ID No. 2992, Seq. ID No. 2996, Seq. ID No. 3002, Seq.

5 ID No. 3006, Seq. ID No. 3022, Seq. ID No. 3026, Seq. ID No. 3044, Seq. ID No.  
3046, Seq. ID No. 3074, Seq. ID No. 3076, Seq. ID No. 3156, Seq. ID No. 3164,  
Seq. ID No. 3166, Seq. ID No. 3168, Seq. ID No. 3184, Seq. ID No. 3214, Seq.  
ID No. 3216, Seq. ID No. 3236, Seq. ID No. 3246, Seq. ID No. 3262, Seq. ID No.  
10 3264, Seq. ID No. 3266, Seq. ID No. 3270, Seq. ID No. 3272, Seq. ID No. 3276,  
Seq. ID No. 3278, Seq. ID No. 3318, Seq. ID No. 3326, Seq. ID No. 3338, Seq.  
ID No. 3352, Seq. ID No. 3390, Seq. ID No. 3406, Seq. ID No. 3420, Seq. ID No.  
3422, Seq. ID No. 3424, Seq. ID No. 3452, Seq. ID No. 3454, Seq. ID No. 3456,  
Seq. ID No. 3492, Seq. ID No. 3496, Seq. ID No. 3504, Seq. ID No. 3506, Seq.  
15 ID No. 3518, Seq. ID No. 3520, Seq. ID No. 3546, Seq. ID No. 3548, Seq. ID No.  
3572, Seq. ID No. 3594, Seq. ID No. 3618, Seq. ID No. 3622, Seq. ID No. 3630,  
Seq. ID No. 3664, Seq. ID No. 3702, Seq. ID No. 3704, Seq. ID No. 3724, Seq.  
ID No. 3738, Seq. ID No. 3742, Seq. ID No. 3746, Seq. ID No. 3748, Seq. ID No.  
3760, Seq. ID No. 3764, Seq. ID No. 3768, Seq. ID No. 3770, Seq. ID No. 3772,  
20 Seq. ID No. 3786, Seq. ID No. 3794, Seq. ID No. 3814, Seq. ID No. 3838, Seq.  
ID No. 3840, Seq. ID No. 3862, Seq. ID No. 3866, Seq. ID No. 3890, Seq. ID No.  
3892, Seq. ID No. 3896, Seq. ID No. 3916, Seq. ID No. 3924, Seq. ID No. 3926,  
Seq. ID No. 3930, Seq. ID No. 3966, Seq. ID No. 3976, Seq. ID No. 3980, Seq.  
ID No. 3996, Seq. ID No. 3998, Seq. ID No. 4010, Seq. ID No. 4040, Seq. ID No.  
25 4042, Seq. ID No. 4062, Seq. ID No. 4080, Seq. ID No. 4082, Seq. ID No. 4112,  
Seq. ID No. 4114, Seq. ID No. 4136, Seq. ID No. 4140, Seq. ID No. 4156, Seq.  
ID No. 4182, Seq. ID No. 4204, Seq. ID No. 4222, Seq. ID No. 4248, Seq. ID No.  
4254, Seq. ID No. 4258, Seq. ID No. 4260, Seq. ID No. 4262, Seq. ID No. 4264,  
Seq. ID No. 4270, Seq. ID No. 4312, Seq. ID No. 4380, Seq. ID No. 4390, Seq.  
30 ID No. 4392, Seq. ID No. 4472, Seq. ID No. 4474, Seq. ID No. 4482, Seq. ID No.  
4526, Seq. ID No. 4552, Seq. ID No. 4562, Seq. ID No. 4574, Seq. ID No. 4618,  
Seq. ID No. 4640, Seq. ID No. 4660, Seq. ID No. 4682, Seq. ID No. 4702, Seq.  
ID No. 4706, Seq. ID No. 4714, Seq. ID No. 4718, Seq. ID No. 4722, Seq. ID No.  
4738, Seq. ID No. 4742, Seq. ID No. 4814, Seq. ID No. 4818, Seq. ID No. 4820,  
Seq. ID No. 4830, Seq. ID No. 4832, Seq. ID No. 4852, Seq. ID No. 4870, Seq.  
ID No. 4876, Seq. ID No. 4914, Seq. ID No. 4920, Seq. ID No. 4930, Seq. ID No.  
4932, Seq. ID No. 4984, Seq. ID No. 4994, Seq. ID No. 5012, Seq. ID No. 5024,  
Seq. ID No. 5032, Seq. ID No. 5034, Seq. ID No. 5036, Seq. ID No. 5044, Seq.

5 ID No. 5062, Seq. ID No. 5064, Seq. ID No. 5070, Seq. ID No. 5104, Seq. ID No.  
5122, Seq. ID No. 5124, Seq. ID No. 5132, Seq. ID No. 5134, Seq. ID No. 5136,  
Seq. ID No. 5138, Seq. ID No. 5140, Seq. ID No. 5142, Seq. ID No. 5152, Seq.  
ID No. 5160, Seq. ID No. 5162, Seq. ID No. 5166, Seq. ID No. 5168, Seq. ID No.  
10 5176, Seq. ID No. 5178, Seq. ID No. 5206, Seq. ID No. 5208, Seq. ID No. 5212,  
Seq. ID No. 5216, Seq. ID No. 5220, Seq. ID No. 5224, Seq. ID No. 5286, Seq.  
ID No. 5288, Seq. ID No. 5330, Seq. ID No. 5332, Seq. ID No. 5378, Seq. ID No.  
5380, Seq. ID No. 5382, Seq. ID No. 5386, Seq. ID No. 5406, Seq. ID No. 5408,  
Seq. ID No. 5454, Seq. ID No. 5460, Seq. ID No. 5462, Seq. ID No. 5464, Seq.  
10 ID No. 5482, Seq. ID No. 5510, Seq. ID No. 5530, Seq. ID No. 5532, Seq. ID No.  
5558, Seq. ID No. 5570, Seq. ID No. 5578, Seq. ID No. 5624, Seq. ID No. 5626,  
Seq. ID No. 5644, Seq. ID No. 5660, Seq. ID No. 5662, Seq. ID No. 5684, Seq.  
ID No. 5686, Seq. ID No. 5710, Seq. ID No. 5712, Seq. ID No. 5734, Seq. ID No.  
15 5740, Seq. ID No. 5766, Seq. ID No. 5798, Seq. ID No. 5828, Seq. ID No. 5890,  
Seq. ID No. 5894, Seq. ID No. 5906, Seq. ID No. 5910, Seq. ID No. 5912, Seq.  
ID No. 5924, Seq. ID No. 5964, Seq. ID No. 5966, Seq. ID No. 6026, Seq. ID No.  
6028, Seq. ID No. 6032, Seq. ID No. 6044, Seq. ID No. 6046, Seq. ID No. 6048,  
Seq. ID No. 6054, Seq. ID No. 6060, Seq. ID No. 6110, Seq. ID No. 6112, Seq.  
ID No. 6116, Seq. ID No. 6118, Seq. ID No. 6128, Seq. ID No. 6132, Seq. ID No.  
20 6136, Seq. ID No. 6138, Seq. ID No. 6162, Seq. ID No. 6166, Seq. ID No. 6184,  
Seq. ID No. 6190, Seq. ID No. 6192, Seq. ID No. 6194, Seq. ID No. 6208, Seq.  
ID No. 6210, Seq. ID No. 6218, Seq. ID No. 6226, Seq. ID No. 6236, Seq. ID No.  
6244, Seq. ID No. 6250, Seq. ID No. 6254, Seq. ID No. 6260, Seq. ID No. 6266,  
Seq. ID No. 6268, Seq. ID No. 6276, Seq. ID No. 6284, Seq. ID No. 6286, Seq.  
25 ID No. 6304, Seq. ID No. 6326, Seq. ID No. 6328, Seq. ID No. 6364, Seq. ID No.  
6366, Seq. ID No. 6368, Seq. ID No. 6386, Seq. ID No. 6426, Seq. ID No. 6428,  
Seq. ID No. 6430, Seq. ID No. 6432, Seq. ID No. 6454, Seq. ID No. 6466, Seq.  
ID No. 6470, Seq. ID No. 6472, Seq. ID No. 6480, Seq. ID No. 6540, Seq. ID No.  
6542, Seq. ID No. 6572, Seq. ID No. 6574, Seq. ID No. 6640, Seq. ID No. 6644,  
30 and Seq. ID No. 6646.

39. The *Alloioococcus otitidis* polypeptide of claim 36, wherein the polypeptide is predicted by HMM SignalP algorithm analysis as having a signal peptide, and is selected from one of Seq. ID No. 4, Seq. ID No. 8, Seq. ID No. 10, Seq. ID No. 20, Seq. ID No. 22, Seq. ID No. 32, Seq. ID No. 34, Seq. ID No. 46, Seq. ID No. 48, Seq. ID No. 50, Seq. ID No. 54, Seq. ID No. 66, Seq. ID No. 68, Seq. ID No. 86, Seq. ID No. 88, Seq. ID No. 106, Seq. ID No. 112, Seq. ID No. 124, Seq. ID No. 132, Seq. ID No. 134, Seq. ID No. 142, Seq. ID No. 160, Seq. ID No. 162, Seq. ID No. 164, Seq. ID No. 172, Seq. ID No. 192, Seq. ID No. 210, Seq. ID No. 212, Seq. ID No. 214, Seq. ID No. 216, Seq. ID No. 218, Seq. ID No. 226, Seq. ID No. 236, Seq. ID No. 238, Seq. ID No. 250, Seq. ID No. 252, Seq. ID No. 256, Seq. ID No. 258, Seq. ID No. 260, Seq. ID No. 272, Seq. ID No. 274, Seq. ID No. 278, Seq. ID No. 286, Seq. ID No. 288, Seq. ID No. 290, Seq. ID No. 328, Seq. ID No. 330, Seq. ID No. 358, Seq. ID No. 360, Seq. ID No. 374, Seq. ID No. 376, Seq. ID No. 394, Seq. ID No. 402, Seq. ID No. 404, Seq. ID No. 456, Seq. ID No. 458, Seq. ID No. 478, Seq. ID No. 488, Seq. ID No. 490, Seq. ID No. 492, Seq. ID No. 494, Seq. ID No. 496, Seq. ID No. 498, Seq. ID No. 500, Seq. ID No. 504, Seq. ID No. 506, Seq. ID No. 510, Seq. ID No. 512, Seq. ID No. 514, Seq. ID No. 516, Seq. ID No. 526, Seq. ID No. 528, Seq. ID No. 546, Seq. ID No. 548, Seq. ID No. 550, Seq. ID No. 558, Seq. ID No. 568, Seq. ID No. 570, Seq. ID No. 576, Seq. ID No. 578, Seq. ID No. 580, Seq. ID No. 592, Seq. ID No. 594, Seq. ID No. 600, Seq. ID No. 618, Seq. ID No. 638, Seq. ID No. 640, Seq. ID No. 642, Seq. ID No. 644, Seq. ID No. 646, Seq. ID No. 648, Seq. ID No. 654, Seq. ID No. 656, Seq. ID No. 658, Seq. ID No. 660, Seq. ID No. 662, Seq. ID No. 668, Seq. ID No. 670, Seq. ID No. 676, Seq. ID No. 678, Seq. ID No. 680, Seq. ID No. 716, Seq. ID No. 718, Seq. ID No. 720, Seq. ID No. 722, Seq. ID No. 724, Seq. ID No. 726, Seq. ID No. 746, Seq. ID No. 748, Seq. ID No. 750, Seq. ID No. 752, Seq. ID No. 756, Seq. ID No. 758, Seq. ID No. 760, Seq. ID No. 762, Seq. ID No. 764, Seq. ID No. 766, Seq. ID No. 770, Seq. ID No. 778, Seq. ID No. 780, Seq. ID No. 782, Seq. ID No. 808, Seq. ID No. 810, Seq. ID No. 820, Seq. ID No. 826, Seq. ID No. 864, Seq. ID No. 894, Seq. ID No. 902, Seq. ID No. 936, Seq. ID No. 938, Seq. ID No. 942, Seq. ID No. 944, Seq. ID No. 956, Seq. ID No. 958, Seq. ID No. 968, Seq. ID No. 980, Seq. ID No. 982, Seq. ID No. 984, Seq. ID No. 986, Seq. ID No. 1002, Seq. ID No. 1004, Seq. ID No. 1006, Seq. ID No. 1008, Seq. ID No. 1010,

Seq. ID No. 1012, Seq. ID No. 1014, Seq. ID No. 1016, Seq. ID No. 1020, Seq.  
ID No. 1030, Seq. ID No. 1032, Seq. ID No. 1034, Seq. ID No. 1036, Seq. ID No.  
1038, Seq. ID No. 1040, Seq. ID No. 1046, Seq. ID No. 1056, Seq. ID No. 1076,  
Seq. ID No. 1078, Seq. ID No. 1106, Seq. ID No. 1108, Seq. ID No. 1132, Seq.  
5 ID No. 1136, Seq. ID No. 1138, Seq. ID No. 1140, Seq. ID No. 1152, Seq. ID No.  
1166, Seq. ID No. 1168, Seq. ID No. 1170, Seq. ID No. 1174, Seq. ID No. 1184,  
Seq. ID No. 1196, Seq. ID No. 1198, Seq. ID No. 1204, Seq. ID No. 1214, Seq.  
ID No. 1224, Seq. ID No. 1228, Seq. ID No. 1230, Seq. ID No. 1238, Seq. ID No.  
1244, Seq. ID No. 1246, Seq. ID No. 1260, Seq. ID No. 1266, Seq. ID No. 1268,  
10 Seq. ID No. 1270, Seq. ID No. 1272, Seq. ID No. 1284, Seq. ID No. 1288, Seq.  
ID No. 1290, Seq. ID No. 1292, Seq. ID No. 1296, Seq. ID No. 1298, Seq. ID No.  
1304, Seq. ID No. 1306, Seq. ID No. 1316, Seq. ID No. 1318, Seq. ID No. 1320,  
Seq. ID No. 1326, Seq. ID No. 1328, Seq. ID No. 1330, Seq. ID No. 1332, Seq.  
ID No. 1338, Seq. ID No. 1342, Seq. ID No. 1344, Seq. ID No. 1348, Seq. ID No.  
15 1350, Seq. ID No. 1352, Seq. ID No. 1354, Seq. ID No. 1366, Seq. ID No. 1368,  
Seq. ID No. 1370, Seq. ID No. 1372, Seq. ID No. 1382, Seq. ID No. 1402, Seq.  
ID No. 1430, Seq. ID No. 1436, Seq. ID No. 1446, Seq. ID No. 1448, Seq. ID No.  
1482, Seq. ID No. 1514, Seq. ID No. 1516, Seq. ID No. 1518, Seq. ID No. 1530,  
Seq. ID No. 1534, Seq. ID No. 1536, Seq. ID No. 1546, Seq. ID No. 1548, Seq.  
20 ID No. 1552, Seq. ID No. 1554, Seq. ID No. 1560, Seq. ID No. 1562, Seq. ID No.  
1564, Seq. ID No. 1572, Seq. ID No. 1580, Seq. ID No. 1584, Seq. ID No. 1586,  
Seq. ID No. 1622, Seq. ID No. 1634, Seq. ID No. 1640, Seq. ID No. 1644, Seq.  
ID No. 1646, Seq. ID No. 1648, Seq. ID No. 1650, Seq. ID No. 1654, Seq. ID No.  
1662, Seq. ID No. 1664, Seq. ID No. 1666, Seq. ID No. 1672, Seq. ID No. 1674,  
25 Seq. ID No. 1678, Seq. ID No. 1680, Seq. ID No. 1682, Seq. ID No. 1694, Seq.  
ID No. 1708, Seq. ID No. 1712, Seq. ID No. 1732, Seq. ID No. 1734, Seq. ID No.  
1738, Seq. ID No. 1754, Seq. ID No. 1756, Seq. ID No. 1758, Seq. ID No. 1766,  
Seq. ID No. 1768, Seq. ID No. 1772, Seq. ID No. 1782, Seq. ID No. 1788, Seq.  
ID No. 1792, Seq. ID No. 1798, Seq. ID No. 1806, Seq. ID No. 1820, Seq. ID No.  
30 1822, Seq. ID No. 1824, Seq. ID No. 1840, Seq. ID No. 1858, Seq. ID No. 1870,  
Seq. ID No. 1876, Seq. ID No. 1892, Seq. ID No. 1894, Seq. ID No. 1896, Seq.  
ID No. 1916, Seq. ID No. 1918, Seq. ID No. 1920, Seq. ID No. 1924, Seq. ID No.  
1928, Seq. ID No. 1930, Seq. ID No. 1970, Seq. ID No. 1982, Seq. ID No. 1992,



Seq. ID No. 1994, Seq. ID No. 2006, Seq. ID No. 2014, Seq. ID No. 2018, Seq.  
ID No. 2020, Seq. ID No. 2026, Seq. ID No. 2028, Seq. ID No. 2034, Seq. ID No.  
2036, Seq. ID No. 2042, Seq. ID No. 2050, Seq. ID No. 2054, Seq. ID No. 2056,  
Seq. ID No. 2088, Seq. ID No. 2090, Seq. ID No. 2092, Seq. ID No. 2106, Seq.  
5 ID No. 2108, Seq. ID No. 2110, Seq. ID No. 2114, Seq. ID No. 2116, Seq. ID No.  
2122, Seq. ID No. 2124, Seq. ID No. 2126, Seq. ID No. 2128, Seq. ID No. 2150,  
Seq. ID No. 2152, Seq. ID No. 2156, Seq. ID No. 2158, Seq. ID No. 2160, Seq.  
ID No. 2172, Seq. ID No. 2174, Seq. ID No. 2178, Seq. ID No. 2188, Seq. ID No.  
2192, Seq. ID No. 2206, Seq. ID No. 2238, Seq. ID No. 2240, Seq. ID No. 2246,  
10 Seq. ID No. 2250, Seq. ID No. 2252, Seq. ID No. 2256, Seq. ID No. 2260, Seq.  
ID No. 2272, Seq. ID No. 2284, Seq. ID No. 2290, Seq. ID No. 2292, Seq. ID No.  
2294, Seq. ID No. 2296, Seq. ID No. 2304, Seq. ID No. 2306, Seq. ID No. 2308,  
Seq. ID No. 2318, Seq. ID No. 2320, Seq. ID No. 2322, Seq. ID No. 2324, Seq.  
ID No. 2326, Seq. ID No. 2328, Seq. ID No. 2330, Seq. ID No. 2334, Seq. ID No.  
15 2344, Seq. ID No. 2348, Seq. ID No. 2350, Seq. ID No. 2352, Seq. ID No. 2354,  
Seq. ID No. 2356, Seq. ID No. 2358, Seq. ID No. 2366, Seq. ID No. 2368, Seq.  
ID No. 2372, Seq. ID No. 2376, Seq. ID No. 2388, Seq. ID No. 2390, Seq. ID No.  
2392, Seq. ID No. 2394, Seq. ID No. 2408, Seq. ID No. 2420, Seq. ID No. 2422,  
Seq. ID No. 2426, Seq. ID No. 2428, Seq. ID No. 2430, Seq. ID No. 2434, Seq.  
20 ID No. 2450, Seq. ID No. 2460, Seq. ID No. 2488, Seq. ID No. 2490, Seq. ID No.  
2492, Seq. ID No. 2494, Seq. ID No. 2498, Seq. ID No. 2500, Seq. ID No. 2502,  
Seq. ID No. 2504, Seq. ID No. 2508, Seq. ID No. 2516, Seq. ID No. 2518, Seq.  
ID No. 2524, Seq. ID No. 2526, Seq. ID No. 2528, Seq. ID No. 2532, Seq. ID No.  
2534, Seq. ID No. 2536, Seq. ID No. 2538, Seq. ID No. 2542, Seq. ID No. 2544,  
25 Seq. ID No. 2546, Seq. ID No. 2556, Seq. ID No. 2558, Seq. ID No. 2566, Seq.  
ID No. 2570, Seq. ID No. 2572, Seq. ID No. 2584, Seq. ID No. 2592, Seq. ID No.  
2598, Seq. ID No. 2600, Seq. ID No. 2602, Seq. ID No. 2608, Seq. ID No. 2612,  
Seq. ID No. 2622, Seq. ID No. 2628, Seq. ID No. 2630, Seq. ID No. 2652, Seq.  
ID No. 2680, Seq. ID No. 2682, Seq. ID No. 2684, Seq. ID No. 2692, Seq. ID No.  
30 2694, Seq. ID No. 2696, Seq. ID No. 2698, Seq. ID No. 2700, Seq. ID No. 2702,  
Seq. ID No. 2704, Seq. ID No. 2706, Seq. ID No. 2708, Seq. ID No. 2718, Seq.  
ID No. 2730, Seq. ID No. 2732, Seq. ID No. 2734, Seq. ID No. 2784, Seq. ID No.  
2786, Seq. ID No. 2802, Seq. ID No. 2810, Seq. ID No. 2814, Seq. ID No. 2816,

Seq. ID No. 2820, Seq. ID No. 2822, Seq. ID No. 2824, Seq. ID No. 2832, Seq.  
ID No. 2834, Seq. ID No. 2836, Seq. ID No. 2838, Seq. ID No. 2840, Seq. ID No.  
2842, Seq. ID No. 2846, Seq. ID No. 2854, Seq. ID No. 2856, Seq. ID No. 2860,  
Seq. ID No. 2862, Seq. ID No. 2874, Seq. ID No. 2882, Seq. ID No. 2894, Seq.  
5 ID No. 2906, Seq. ID No. 2936, Seq. ID No. 2938, Seq. ID No. 2940, Seq. ID No.  
2942, Seq. ID No. 2948, Seq. ID No. 2950, Seq. ID No. 2952, Seq. ID No. 2970,  
Seq. ID No. 2974, Seq. ID No. 2976, Seq. ID No. 2978, Seq. ID No. 2982, Seq.  
ID No. 2984, Seq. ID No. 2988, Seq. ID No. 2992, Seq. ID No. 2996, Seq. ID No.  
2998, Seq. ID No. 3006, Seq. ID No. 3008, Seq. ID No. 3010, Seq. ID No. 3012,  
10 Seq. ID No. 3014, Seq. ID No. 3024, Seq. ID No. 3026, Seq. ID No. 3028, Seq.  
ID No. 3030, Seq. ID No. 3032, Seq. ID No. 3044, Seq. ID No. 3056, Seq. ID No.  
3064, Seq. ID No. 3072, Seq. ID No. 3074, Seq. ID No. 3076, Seq. ID No. 3078,  
Seq. ID No. 3120, Seq. ID No. 3122, Seq. ID No. 3124, Seq. ID No. 3146, Seq.  
ID No. 3156, Seq. ID No. 3158, Seq. ID No. 3164, Seq. ID No. 3166, Seq. ID No.  
15 3174, Seq. ID No. 3184, Seq. ID No. 3194, Seq. ID No. 3202, Seq. ID No. 3214,  
Seq. ID No. 3216, Seq. ID No. 3218, Seq. ID No. 3220, Seq. ID No. 3242, Seq.  
ID No. 3244, Seq. ID No. 3246, Seq. ID No. 3250, Seq. ID No. 3256, Seq. ID No.  
3258, Seq. ID No. 3262, Seq. ID No. 3264, Seq. ID No. 3270, Seq. ID No. 3276,  
Seq. ID No. 3278, Seq. ID No. 3298, Seq. ID No. 3318, Seq. ID No. 3324, Seq.  
20 ID No. 3326, Seq. ID No. 3332, Seq. ID No. 3336, Seq. ID No. 3338, Seq. ID No.  
3340, Seq. ID No. 3350, Seq. ID No. 3352, Seq. ID No. 3354, Seq. ID No. 3356,  
Seq. ID No. 3358, Seq. ID No. 3360, Seq. ID No. 3376, Seq. ID No. 3378, Seq.  
ID No. 3390, Seq. ID No. 3392, Seq. ID No. 3396, Seq. ID No. 3406, Seq. ID No.  
3416, Seq. ID No. 3422, Seq. ID No. 3426, Seq. ID No. 3428, Seq. ID No. 3434,  
25 Seq. ID No. 3442, Seq. ID No. 3450, Seq. ID No. 3452, Seq. ID No. 3454, Seq.  
ID No. 3456, Seq. ID No. 3458, Seq. ID No. 3464, Seq. ID No. 3482, Seq. ID No.  
3492, Seq. ID No. 3494, Seq. ID No. 3504, Seq. ID No. 3506, Seq. ID No. 3518,  
Seq. ID No. 3520, Seq. ID No. 3528, Seq. ID No. 3532, Seq. ID No. 3540, Seq.  
ID No. 3562, Seq. ID No. 3574, Seq. ID No. 3582, Seq. ID No. 3588, Seq. ID No.  
30 3594, Seq. ID No. 3596, Seq. ID No. 3612, Seq. ID No. 3618, Seq. ID No. 3620,  
Seq. ID No. 3622, Seq. ID No. 3626, Seq. ID No. 3630, Seq. ID No. 3636, Seq.  
ID No. 3678, Seq. ID No. 3680, Seq. ID No. 3690, Seq. ID No. 3718, Seq. ID No.  
3724, Seq. ID No. 3728, Seq. ID No. 3742, Seq. ID No. 3746, Seq. ID No. 3754,

Seq. ID No. 3756, Seq. ID No. 3758, Seq. ID No. 3762, Seq. ID No. 3764, Seq.  
ID No. 3766, Seq. ID No. 3782, Seq. ID No. 3784, Seq. ID No. 3794, Seq. ID No.  
3800, Seq. ID No. 3808, Seq. ID No. 3814, Seq. ID No. 3816, Seq. ID No. 3818,  
Seq. ID No. 3838, Seq. ID No. 3840, Seq. ID No. 3850, Seq. ID No. 3852, Seq.  
5 ID No. 3854, Seq. ID No. 3860, Seq. ID No. 3862, Seq. ID No. 3864, Seq. ID No.  
3866, Seq. ID No. 3880, Seq. ID No. 3890, Seq. ID No. 3892, Seq. ID No. 3896,  
Seq. ID No. 3904, Seq. ID No. 3916, Seq. ID No. 3924, Seq. ID No. 3926, Seq.  
ID No. 3960, Seq. ID No. 3964, Seq. ID No. 3974, Seq. ID No. 3976, Seq. ID No.  
3994, Seq. ID No. 3996, Seq. ID No. 3998, Seq. ID No. 4006, Seq. ID No. 4008,  
10 Seq. ID No. 4010, Seq. ID No. 4026, Seq. ID No. 4028, Seq. ID No. 4040, Seq.  
ID No. 4042, Seq. ID No. 4044, Seq. ID No. 4046, Seq. ID No. 4048, Seq. ID No.  
4050, Seq. ID No. 4062, Seq. ID No. 4072, Seq. ID No. 4074, Seq. ID No. 4080,  
Seq. ID No. 4082, Seq. ID No. 4084, Seq. ID No. 4102, Seq. ID No. 4104, Seq.  
ID No. 4112, Seq. ID No. 4134, Seq. ID No. 4136, Seq. ID No. 4138, Seq. ID No.  
15 4140, Seq. ID No. 4142, Seq. ID No. 4144, Seq. ID No. 4146, Seq. ID No. 4152,  
Seq. ID No. 4154, Seq. ID No. 4182, Seq. ID No. 4222, Seq. ID No. 4224, Seq.  
ID No. 4226, Seq. ID No. 4228, Seq. ID No. 4232, Seq. ID No. 4234, Seq. ID No.  
4242, Seq. ID No. 4248, Seq. ID No. 4254, Seq. ID No. 4258, Seq. ID No. 4260,  
Seq. ID No. 4262, Seq. ID No. 4264, Seq. ID No. 4266, Seq. ID No. 4270, Seq.  
20 ID No. 4276, Seq. ID No. 4286, Seq. ID No. 4288, Seq. ID No. 4298, Seq. ID No.  
4308, Seq. ID No. 4312, Seq. ID No. 4314, Seq. ID No. 4344, Seq. ID No. 4380,  
Seq. ID No. 4386, Seq. ID No. 4390, Seq. ID No. 4392, Seq. ID No. 4400, Seq.  
ID No. 4404, Seq. ID No. 4438, Seq. ID No. 4440, Seq. ID No. 4442, Seq. ID No.  
4470, Seq. ID No. 4474, Seq. ID No. 4482, Seq. ID No. 4484, Seq. ID No. 4486,  
25 Seq. ID No. 4494, Seq. ID No. 4496, Seq. ID No. 4498, Seq. ID No. 4514, Seq.  
ID No. 4516, Seq. ID No. 4528, Seq. ID No. 4530, Seq. ID No. 4534, Seq. ID No.  
4588, Seq. ID No. 4590, Seq. ID No. 4640, Seq. ID No. 4642, Seq. ID No. 4644,  
Seq. ID No. 4660, Seq. ID No. 4682, Seq. ID No. 4688, Seq. ID No. 4696, Seq.  
ID No. 4706, Seq. ID No. 4708, Seq. ID No. 4710, Seq. ID No. 4712, Seq. ID No.  
30 4716, Seq. ID No. 4718, Seq. ID No. 4738, Seq. ID No. 4760, Seq. ID No. 4814,  
Seq. ID No. 4828, Seq. ID No. 4854, Seq. ID No. 4864, Seq. ID No. 4870, Seq.  
ID No. 4872, Seq. ID No. 4874, Seq. ID No. 4876, Seq. ID No. 4920, Seq. ID No.  
4922, Seq. ID No. 4924, Seq. ID No. 4930, Seq. ID No. 4932, Seq. ID No. 4950,

Seq. ID No. 4952, Seq. ID No. 4976, Seq. ID No. 4988, Seq. ID No. 5000, Seq.  
ID No. 5014, Seq. ID No. 5032, Seq. ID No. 5062, Seq. ID No. 5064, Seq. ID No.  
5070, Seq. ID No. 5086, Seq. ID No. 5104, Seq. ID No. 5116, Seq. ID No. 5124,  
Seq. ID No. 5126, Seq. ID No. 5130, Seq. ID No. 5132, Seq. ID No. 5134, Seq.  
5 ID No. 5136, Seq. ID No. 5138, Seq. ID No. 5140, Seq. ID No. 5142, Seq. ID No.  
5160, Seq. ID No. 5166, Seq. ID No. 5176, Seq. ID No. 5198, Seq. ID No. 5200,  
Seq. ID No. 5206, Seq. ID No. 5208, Seq. ID No. 5214, Seq. ID No. 5220, Seq.  
ID No. 5224, Seq. ID No. 5268, Seq. ID No. 5274, Seq. ID No. 5276, Seq. ID No.  
5278, Seq. ID No. 5280, Seq. ID No. 5282, Seq. ID No. 5286, Seq. ID No. 5328,  
10 Seq. ID No. 5330, Seq. ID No. 5332, Seq. ID No. 5342, Seq. ID No. 5378, Seq.  
ID No. 5380, Seq. ID No. 5386, Seq. ID No. 5388, Seq. ID No. 5406, Seq. ID No.  
5414, Seq. ID No. 5416, Seq. ID No. 5434, Seq. ID No. 5454, Seq. ID No. 5460,  
Seq. ID No. 5462, Seq. ID No. 5464, Seq. ID No. 5466, Seq. ID No. 5492, Seq.  
ID No. 5498, Seq. ID No. 5510, Seq. ID No. 5514, Seq. ID No. 5516, Seq. ID No.  
15 5518, Seq. ID No. 5526, Seq. ID No. 5530, Seq. ID No. 5532, Seq. ID No. 5534,  
Seq. ID No. 5544, Seq. ID No. 5546, Seq. ID No. 5570, Seq. ID No. 5588, Seq.  
ID No. 5590, Seq. ID No. 5592, Seq. ID No. 5594, Seq. ID No. 5596, Seq. ID No.  
5598, Seq. ID No. 5610, Seq. ID No. 5612, Seq. ID No. 5622, Seq. ID No. 5624,  
Seq. ID No. 5626, Seq. ID No. 5634, Seq. ID No. 5638, Seq. ID No. 5640, Seq.  
20 ID No. 5642, Seq. ID No. 5644, Seq. ID No. 5650, Seq. ID No. 5660, Seq. ID No.  
5668, Seq. ID No. 5682, Seq. ID No. 5684, Seq. ID No. 5686, Seq. ID No. 5688,  
Seq. ID No. 5690, Seq. ID No. 5700, Seq. ID No. 5704, Seq. ID No. 5706, Seq.  
ID No. 5710, Seq. ID No. 5712, Seq. ID No. 5720, Seq. ID No. 5730, Seq. ID No.  
5734, Seq. ID No. 5736, Seq. ID No. 5740, Seq. ID No. 5764, Seq. ID No. 5766,  
25 Seq. ID No. 5768, Seq. ID No. 5772, Seq. ID No. 5784, Seq. ID No. 5786, Seq.  
ID No. 5792, Seq. ID No. 5798, Seq. ID No. 5830, Seq. ID No. 5880, Seq. ID No.  
5884, Seq. ID No. 5886, Seq. ID No. 5890, Seq. ID No. 5894, Seq. ID No. 5896,  
Seq. ID No. 5900, Seq. ID No. 5902, Seq. ID No. 5906, Seq. ID No. 5910, Seq.  
ID No. 5922, Seq. ID No. 5924, Seq. ID No. 5928, Seq. ID No. 5930, Seq. ID No.  
30 5940, Seq. ID No. 6024, Seq. ID No. 6026, Seq. ID No. 6028, Seq. ID No. 6044,  
Seq. ID No. 6048, Seq. ID No. 6054, Seq. ID No. 6060, Seq. ID No. 6064, Seq.  
ID No. 6068, Seq. ID No. 6088, Seq. ID No. 6090, Seq. ID No. 6092, Seq. ID No.  
6096, Seq. ID No. 6104, Seq. ID No. 6108, Seq. ID No. 6110, Seq. ID No. 6112,

Seq. ID No. 6116, Seq. ID No. 6118, Seq. ID No. 6136, Seq. ID No. 6138, Seq. ID No. 6160, Seq. ID No. 6162, Seq. ID No. 6164, Seq. ID No. 6166, Seq. ID No. 6170, Seq. ID No. 6184, Seq. ID No. 6186, Seq. ID No. 6188, Seq. ID No. 6190, Seq. ID No. 6192, Seq. ID No. 6198, Seq. ID No. 6204, Seq. ID No. 6206, Seq. ID No. 6210, Seq. ID No. 6218, Seq. ID No. 6222, Seq. ID No. 6224, Seq. ID No. 6226, Seq. ID No. 6228, Seq. ID No. 6230, Seq. ID No. 6236, Seq. ID No. 6238, Seq. ID No. 6242, Seq. ID No. 6244, Seq. ID No. 6246, Seq. ID No. 6250, Seq. ID No. 6254, Seq. ID No. 6260, Seq. ID No. 6264, Seq. ID No. 6266, Seq. ID No. 6268, Seq. ID No. 6274, Seq. ID No. 6276, Seq. ID No. 6284, Seq. ID No. 6286, Seq. ID No. 6290, Seq. ID No. 6302, Seq. ID No. 6304, Seq. ID No. 6326, Seq. ID No. 6328, Seq. ID No. 6364, Seq. ID No. 6366, Seq. ID No. 6378, Seq. ID No. 6382, Seq. ID No. 6384, Seq. ID No. 6416, Seq. ID No. 6426, Seq. ID No. 6428, Seq. ID No. 6430, Seq. ID No. 6432, Seq. ID No. 6474, Seq. ID No. 6480, Seq. ID No. 6498, Seq. ID No. 6518, Seq. ID No. 6542, Seq. ID No. 6544, Seq. ID No. 6556, Seq. ID No. 6558, Seq. ID No. 6572, Seq. ID No. 6574, Seq. ID No. 6582, Seq. ID No. 6594, Seq. ID No. 6596, Seq. ID No. 6598, Seq. ID No. 6600, Seq. ID No. 6602, Seq. ID No. 6604, Seq. ID No. 6632, Seq. ID No. 6638, Seq. ID No. 6640, Seq. ID No. 6644, Seq. ID No. 6646, and Seq. ID No. 6650.

40. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is predicted by HMM SignalP algorithm analysis as being a non-secretory protein, and is selected from one of Seq. ID No. 2, Seq. ID No. 6, Seq. ID No. 12, Seq. ID No. 14, Seq. ID No. 16, Seq. ID No. 18, Seq. ID No. 24, Seq. ID No. 26, Seq. ID No. 28, Seq. ID No. 30, Seq. ID No. 36, Seq. ID No. 38, Seq. ID No. 40, Seq. ID No. 42, Seq. ID No. 44, Seq. ID No. 52, Seq. ID No. 56, Seq. ID No. 58, Seq. ID No. 60, Seq. ID No. 62, Seq. ID No. 64, Seq. ID No. 70, Seq. ID No. 72, Seq. ID No. 74, Seq. ID No. 76, Seq. ID No. 78, Seq. ID No. 80, Seq. ID No. 82, Seq. ID No. 84, Seq. ID No. 90, Seq. ID No. 92, Seq. ID No. 94, Seq. ID No. 96, Seq. ID No. 98, Seq. ID No. 100, Seq. ID No. 102, Seq. ID No. 104, Seq. ID No. 108, Seq. ID No. 110, Seq. ID No. 114, Seq. ID No. 116, Seq. ID No. 118, Seq. ID No. 120, Seq. ID No. 122, Seq. ID No. 126, Seq. ID No. 128, Seq. ID No. 130, Seq. ID No. 136, Seq. ID No. 138, Seq. ID No. 140, Seq. ID No. 144, Seq. ID No. 146, Seq. ID No. 148, Seq. ID No. 150, Seq. ID No. 152, Seq. ID No. 154, Seq. ID No. 156, Seq. ID No. 158, Seq. ID No. 166, Seq. ID No. 168, Seq. ID No. 170, Seq.

5 ID No. 174, Seq. ID No. 176, Seq. ID No. 178, Seq. ID No. 180, Seq. ID No. 182,  
Seq. ID No. 184, Seq. ID No. 186, Seq. ID No. 188, Seq. ID No. 190, Seq. ID No.  
194, Seq. ID No. 196, Seq. ID No. 198, Seq. ID No. 200, Seq. ID No. 202, Seq.  
ID No. 204, Seq. ID No. 206, Seq. ID No. 208, Seq. ID No. 220, Seq. ID No. 222,  
Seq. ID No. 224, Seq. ID No. 228, Seq. ID No. 230, Seq. ID No. 232, Seq. ID No.  
234, Seq. ID No. 240, Seq. ID No. 242, Seq. ID No. 244, Seq. ID No. 246, Seq.  
ID No. 248, Seq. ID No. 254, Seq. ID No. 262, Seq. ID No. 264, Seq. ID No. 266,  
Seq. ID No. 268, Seq. ID No. 270, Seq. ID No. 276, Seq. ID No. 280, Seq. ID No.  
282, Seq. ID No. 284, Seq. ID No. 292, Seq. ID No. 294, Seq. ID No. 296, Seq.  
10 ID No. 298, Seq. ID No. 300, Seq. ID No. 302, Seq. ID No. 304, Seq. ID No. 306,  
Seq. ID No. 308, Seq. ID No. 310, Seq. ID No. 312, Seq. ID No. 314, Seq. ID No.  
316, Seq. ID No. 318, Seq. ID No. 320, Seq. ID No. 322, Seq. ID No. 324, Seq.  
ID No. 326, Seq. ID No. 332, Seq. ID No. 334, Seq. ID No. 336, Seq. ID No. 338,  
Seq. ID No. 340, Seq. ID No. 342, Seq. ID No. 344, Seq. ID No. 346, Seq. ID No.  
15 348, Seq. ID No. 350, Seq. ID No. 352, Seq. ID No. 354, Seq. ID No. 356, Seq.  
ID No. 362, Seq. ID No. 364, Seq. ID No. 366, Seq. ID No. 368, Seq. ID No. 370,  
Seq. ID No. 372, Seq. ID No. 378, Seq. ID No. 380, Seq. ID No. 382, Seq. ID No.  
384, Seq. ID No. 386, Seq. ID No. 388, Seq. ID No. 390, Seq. ID No. 392, Seq.  
ID No. 396, Seq. ID No. 398, Seq. ID No. 400, Seq. ID No. 406, Seq. ID No. 408,  
20 Seq. ID No. 410, Seq. ID No. 412, Seq. ID No. 414, Seq. ID No. 416, Seq. ID No.  
418, Seq. ID No. 420, Seq. ID No. 422, Seq. ID No. 424, Seq. ID No. 426, Seq.  
ID No. 428, Seq. ID No. 430, Seq. ID No. 432, Seq. ID No. 434, Seq. ID No. 436,  
Seq. ID No. 438, Seq. ID No. 440, Seq. ID No. 442, Seq. ID No. 444, Seq. ID No.  
446, Seq. ID No. 448, Seq. ID No. 450, Seq. ID No. 452, Seq. ID No. 454, Seq.  
25 ID No. 460, Seq. ID No. 462, Seq. ID No. 464, Seq. ID No. 466, Seq. ID No. 468,  
Seq. ID No. 470, Seq. ID No. 472, Seq. ID No. 474, Seq. ID No. 476, Seq. ID No.  
480, Seq. ID No. 482, Seq. ID No. 484, Seq. ID No. 486, Seq. ID No. 502, Seq.  
ID No. 508, Seq. ID No. 518, Seq. ID No. 520, Seq. ID No. 522, Seq. ID No. 524,  
Seq. ID No. 530, Seq. ID No. 532, Seq. ID No. 534, Seq. ID No. 536, Seq. ID No.  
30 538, Seq. ID No. 540, Seq. ID No. 542, Seq. ID No. 544, Seq. ID No. 552, Seq.  
ID No. 554, Seq. ID No. 556, Seq. ID No. 560, Seq. ID No. 562, Seq. ID No. 564,  
Seq. ID No. 566, Seq. ID No. 572, Seq. ID No. 574, Seq. ID No. 582, Seq. ID No.  
584, Seq. ID No. 586, Seq. ID No. 588, Seq. ID No. 590, Seq. ID No. 596, Seq.

5 ID No. 598, Seq. ID No. 602, Seq. ID No. 604, Seq. ID No. 606, Seq. ID No. 608,  
Seq. ID No. 610, Seq. ID No. 612, Seq. ID No. 614, Seq. ID No. 616, Seq. ID No.  
620, Seq. ID No. 622, Seq. ID No. 624, Seq. ID No. 626, Seq. ID No. 628, Seq.  
ID No. 630, Seq. ID No. 632, Seq. ID No. 634, Seq. ID No. 636, Seq. ID No. 650,  
Seq. ID No. 652, Seq. ID No. 664, Seq. ID No. 666, Seq. ID No. 672, Seq. ID No.  
674, Seq. ID No. 682, Seq. ID No. 684, Seq. ID No. 686, Seq. ID No. 688, Seq.  
ID No. 690, Seq. ID No. 692, Seq. ID No. 694, Seq. ID No. 696, Seq. ID No. 698,  
Seq. ID No. 700, Seq. ID No. 702, Seq. ID No. 704, Seq. ID No. 706, Seq. ID No.  
708, Seq. ID No. 710, Seq. ID No. 712, Seq. ID No. 714, Seq. ID No. 728, Seq.  
10 ID No. 730, Seq. ID No. 732, Seq. ID No. 734, Seq. ID No. 736, Seq. ID No. 738,  
Seq. ID No. 740, Seq. ID No. 742, Seq. ID No. 744, Seq. ID No. 754, Seq. ID No.  
768, Seq. ID No. 772, Seq. ID No. 774, Seq. ID No. 776, Seq. ID No. 784, Seq.  
ID No. 786, Seq. ID No. 788, Seq. ID No. 790, Seq. ID No. 792, Seq. ID No. 794,  
Seq. ID No. 796, Seq. ID No. 798, Seq. ID No. 800, Seq. ID No. 802, Seq. ID No.  
15 804, Seq. ID No. 806, Seq. ID No. 812, Seq. ID No. 814, Seq. ID No. 816, Seq.  
ID No. 818, Seq. ID No. 822, Seq. ID No. 824, Seq. ID No. 828, Seq. ID No. 830,  
Seq. ID No. 832, Seq. ID No. 834, Seq. ID No. 836, Seq. ID No. 838, Seq. ID No.  
840, Seq. ID No. 842, Seq. ID No. 844, Seq. ID No. 846, Seq. ID No. 848, Seq.  
ID No. 850, Seq. ID No. 852, Seq. ID No. 854, Seq. ID No. 856, Seq. ID No. 858,  
20 Seq. ID No. 860, Seq. ID No. 862, Seq. ID No. 866, Seq. ID No. 868, Seq. ID No.  
870, Seq. ID No. 872, Seq. ID No. 874, Seq. ID No. 876, Seq. ID No. 878, Seq.  
ID No. 880, Seq. ID No. 882, Seq. ID No. 884, Seq. ID No. 886, Seq. ID No. 888,  
Seq. ID No. 890, Seq. ID No. 892, Seq. ID No. 896, Seq. ID No. 898, Seq. ID No.  
900, Seq. ID No. 904, Seq. ID No. 906, Seq. ID No. 908, Seq. ID No. 910, Seq.  
25 ID No. 912, Seq. ID No. 914, Seq. ID No. 916, Seq. ID No. 918, Seq. ID No. 920,  
Seq. ID No. 922, Seq. ID No. 924, Seq. ID No. 926, Seq. ID No. 928, Seq. ID No.  
930, Seq. ID No. 932, Seq. ID No. 934, Seq. ID No. 940, Seq. ID No. 946, Seq.  
ID No. 948, Seq. ID No. 950, Seq. ID No. 952, Seq. ID No. 954, Seq. ID No. 960,  
Seq. ID No. 962, Seq. ID No. 964, Seq. ID No. 966, Seq. ID No. 970, Seq. ID No.  
30 972, Seq. ID No. 974, Seq. ID No. 976, Seq. ID No. 978, Seq. ID No. 988, Seq.  
ID No. 990, Seq. ID No. 992, Seq. ID No. 994, Seq. ID No. 996, Seq. ID No. 998,  
Seq. ID No. 1000, Seq. ID No. 1018, Seq. ID No. 1022, Seq. ID No. 1024, Seq.  
ID No. 1026, Seq. ID No. 1028, Seq. ID No. 1042, Seq. ID No. 1044, Seq. ID No.

1048, Seq. ID No. 1050, Seq. ID No. 1052, Seq. ID No. 1054, Seq. ID No. 1058,  
Seq. ID No. 1060, Seq. ID No. 1062, Seq. ID No. 1064, Seq. ID No. 1066, Seq.  
ID No. 1068, Seq. ID No. 1070, Seq. ID No. 1072, Seq. ID No. 1074, Seq. ID No.  
1080, Seq. ID No. 1082, Seq. ID No. 1084, Seq. ID No. 1086, Seq. ID No. 1088,  
5 Seq. ID No. 1090, Seq. ID No. 1092, Seq. ID No. 1094, Seq. ID No. 1096, Seq.  
ID No. 1098, Seq. ID No. 1100, Seq. ID No. 1102, Seq. ID No. 1104, Seq. ID No.  
1110, Seq. ID No. 1112, Seq. ID No. 1114, Seq. ID No. 1116, Seq. ID No. 1118,  
Seq. ID No. 1120, Seq. ID No. 1122, Seq. ID No. 1124, Seq. ID No. 1126, Seq.  
ID No. 1128, Seq. ID No. 1130, Seq. ID No. 1134, Seq. ID No. 1142, Seq. ID No.  
10 1144, Seq. ID No. 1146, Seq. ID No. 1148, Seq. ID No. 1150, Seq. ID No. 1154,  
Seq. ID No. 1156, Seq. ID No. 1158, Seq. ID No. 1160, Seq. ID No. 1162, Seq.  
ID No. 1164, Seq. ID No. 1172, Seq. ID No. 1176, Seq. ID No. 1178, Seq. ID No.  
1180, Seq. ID No. 1182, Seq. ID No. 1186, Seq. ID No. 1188, Seq. ID No. 1190,  
Seq. ID No. 1192, Seq. ID No. 1194, Seq. ID No. 1200, Seq. ID No. 1202, Seq.  
15 ID No. 1206, Seq. ID No. 1208, Seq. ID No. 1210, Seq. ID No. 1212, Seq. ID No.  
1216, Seq. ID No. 1218, Seq. ID No. 1220, Seq. ID No. 1222, Seq. ID No. 1226,  
Seq. ID No. 1232, Seq. ID No. 1234, Seq. ID No. 1236, Seq. ID No. 1240, Seq.  
ID No. 1242, Seq. ID No. 1248, Seq. ID No. 1250, Seq. ID No. 1252, Seq. ID No.  
1254, Seq. ID No. 1256, Seq. ID No. 1258, Seq. ID No. 1262, Seq. ID No. 1264,  
20 Seq. ID No. 1274, Seq. ID No. 1276, Seq. ID No. 1278, Seq. ID No. 1280, Seq.  
ID No. 1282, Seq. ID No. 1286, Seq. ID No. 1294, Seq. ID No. 1300, Seq. ID No.  
1302, Seq. ID No. 1308, Seq. ID No. 1310, Seq. ID No. 1312, Seq. ID No. 1314,  
Seq. ID No. 1322, Seq. ID No. 1324, Seq. ID No. 1334, Seq. ID No. 1336, Seq.  
ID No. 1340, Seq. ID No. 1346, Seq. ID No. 1356, Seq. ID No. 1358, Seq. ID No.  
25 1360, Seq. ID No. 1362, Seq. ID No. 1364, Seq. ID No. 1374, Seq. ID No. 1376,  
Seq. ID No. 1378, Seq. ID No. 1380, Seq. ID No. 1384, Seq. ID No. 1386, Seq.  
ID No. 1388, Seq. ID No. 1390, Seq. ID No. 1392, Seq. ID No. 1394, Seq. ID No.  
1396, Seq. ID No. 1398, Seq. ID No. 1400, Seq. ID No. 1404, Seq. ID No. 1406,  
Seq. ID No. 1408, Seq. ID No. 1410, Seq. ID No. 1412, Seq. ID No. 1414, Seq.  
30 ID No. 1416, Seq. ID No. 1418, Seq. ID No. 1420, Seq. ID No. 1422, Seq. ID No.  
1424, Seq. ID No. 1426, Seq. ID No. 1428, Seq. ID No. 1432, Seq. ID No. 1434,  
Seq. ID No. 1438, Seq. ID No. 1440, Seq. ID No. 1442, Seq. ID No. 1444, Seq.  
ID No. 1450, Seq. ID No. 1452, Seq. ID No. 1454, Seq. ID No. 1456, Seq. ID No.



1458, Seq. ID No. 1460, Seq. ID No. 1462, Seq. ID No. 1464, Seq. ID No. 1466,  
Seq. ID No. 1468, Seq. ID No. 1470, Seq. ID No. 1472, Seq. ID No. 1474, Seq.  
ID No. 1476, Seq. ID No. 1478, Seq. ID No. 1480, Seq. ID No. 1484, Seq. ID No.  
1486, Seq. ID No. 1488, Seq. ID No. 1490, Seq. ID No. 1492, Seq. ID No. 1494,  
5 Seq. ID No. 1496, Seq. ID No. 1498, Seq. ID No. 1500, Seq. ID No. 1502, Seq.  
ID No. 1504, Seq. ID No. 1506, Seq. ID No. 1508, Seq. ID No. 1510, Seq. ID No.  
1512, Seq. ID No. 1520, Seq. ID No. 1522, Seq. ID No. 1524, Seq. ID No. 1526,  
Seq. ID No. 1528, Seq. ID No. 1532, Seq. ID No. 1538, Seq. ID No. 1540, Seq.  
ID No. 1542, Seq. ID No. 1544, Seq. ID No. 1550, Seq. ID No. 1556, Seq. ID No.  
10 1558, Seq. ID No. 1566, Seq. ID No. 1568, Seq. ID No. 1570, Seq. ID No. 1574,  
Seq. ID No. 1576, Seq. ID No. 1578, Seq. ID No. 1582, Seq. ID No. 1588, Seq.  
ID No. 1590, Seq. ID No. 1592, Seq. ID No. 1594, Seq. ID No. 1596, Seq. ID No.  
1598, Seq. ID No. 1602, Seq. ID No. 1604, Seq. ID No. 1606, Seq. ID No. 1608,  
Seq. ID No. 1610, Seq. ID No. 1612, Seq. ID No. 1614, Seq. ID No. 1616, Seq.  
15 ID No. 1618, Seq. ID No. 1620, Seq. ID No. 1624, Seq. ID No. 1626, Seq. ID No.  
1628, Seq. ID No. 1630, Seq. ID No. 1632, Seq. ID No. 1636, Seq. ID No. 1638,  
Seq. ID No. 1642, Seq. ID No. 1652, Seq. ID No. 1656, Seq. ID No. 1658, Seq.  
ID No. 1660, Seq. ID No. 1668, Seq. ID No. 1670, Seq. ID No. 1676, Seq. ID No.  
1684, Seq. ID No. 1686, Seq. ID No. 1688, Seq. ID No. 1690, Seq. ID No. 1692,  
20 Seq. ID No. 1696, Seq. ID No. 1698, Seq. ID No. 1700, Seq. ID No. 1702, Seq.  
ID No. 1704, Seq. ID No. 1706, Seq. ID No. 1710, Seq. ID No. 1714, Seq. ID No.  
1716, Seq. ID No. 1718, Seq. ID No. 1720, Seq. ID No. 1722, Seq. ID No. 1724,  
Seq. ID No. 1726, Seq. ID No. 1728, Seq. ID No. 1730, Seq. ID No. 1736, Seq.  
ID No. 1740, Seq. ID No. 1742, Seq. ID No. 1744, Seq. ID No. 1746, Seq. ID No.  
25 1748, Seq. ID No. 1750, Seq. ID No. 1752, Seq. ID No. 1760, Seq. ID No. 1762,  
Seq. ID No. 1764, Seq. ID No. 1770, Seq. ID No. 1774, Seq. ID No. 1776, Seq.  
ID No. 1778, Seq. ID No. 1780, Seq. ID No. 1784, Seq. ID No. 1786, Seq. ID No.  
1790, Seq. ID No. 1794, Seq. ID No. 1796, Seq. ID No. 1800, Seq. ID No. 1802,  
Seq. ID No. 1804, Seq. ID No. 1808, Seq. ID No. 1810, Seq. ID No. 1812, Seq.  
30 ID No. 1814, Seq. ID No. 1816, Seq. ID No. 1818, Seq. ID No. 1826, Seq. ID No.  
1828, Seq. ID No. 1830, Seq. ID No. 1832, Seq. ID No. 1834, Seq. ID No. 1836,  
Seq. ID No. 1838, Seq. ID No. 1842, Seq. ID No. 1844, Seq. ID No. 1846, Seq.  
ID No. 1848, Seq. ID No. 1850, Seq. ID No. 1852, Seq. ID No. 1854, Seq. ID No.

1856, Seq. ID No. 1860, Seq. ID No. 1862, Seq. ID No. 1864, Seq. ID No. 1866,  
Seq. ID No. 1868, Seq. ID No. 1872, Seq. ID No. 1874, Seq. ID No. 1878, Seq.  
ID No. 1880, Seq. ID No. 1882, Seq. ID No. 1884, Seq. ID No. 1886, Seq. ID No.  
1888, Seq. ID No. 1890, Seq. ID No. 1898, Seq. ID No. 1900, Seq. ID No. 1902,  
5 Seq. ID No. 1904, Seq. ID No. 1906, Seq. ID No. 1908, Seq. ID No. 1910, Seq.  
ID No. 1912, Seq. ID No. 1914, Seq. ID No. 1922, Seq. ID No. 1926, Seq. ID No.  
1932, Seq. ID No. 1934, Seq. ID No. 1936, Seq. ID No. 1938, Seq. ID No. 1940,  
Seq. ID No. 1942, Seq. ID No. 1944, Seq. ID No. 1946, Seq. ID No. 1948, Seq.  
ID No. 1950, Seq. ID No. 1952, Seq. ID No. 1954, Seq. ID No. 1956, Seq. ID No.  
10 1958, Seq. ID No. 1960, Seq. ID No. 1962, Seq. ID No. 1964, Seq. ID No. 1966,  
Seq. ID No. 1968, Seq. ID No. 1972, Seq. ID No. 1974, Seq. ID No. 1976, Seq.  
ID No. 1978, Seq. ID No. 1980, Seq. ID No. 1984, Seq. ID No. 1986, Seq. ID No.  
1988, Seq. ID No. 1990, Seq. ID No. 1996, Seq. ID No. 1998, Seq. ID No. 2000,  
Seq. ID No. 2002, Seq. ID No. 2004, Seq. ID No. 2008, Seq. ID No. 2010, Seq.  
15 ID No. 2012, Seq. ID No. 2016, Seq. ID No. 2022, Seq. ID No. 2024, Seq. ID No.  
2030, Seq. ID No. 2032, Seq. ID No. 2038, Seq. ID No. 2040, Seq. ID No. 2044,  
Seq. ID No. 2046, Seq. ID No. 2048, Seq. ID No. 2052, Seq. ID No. 2058, Seq.  
ID No. 2060, Seq. ID No. 2062, Seq. ID No. 2064, Seq. ID No. 2066, Seq. ID No.  
2068, Seq. ID No. 2070, Seq. ID No. 2072, Seq. ID No. 2074, Seq. ID No. 2076,  
20 Seq. ID No. 2078, Seq. ID No. 2080, Seq. ID No. 2082, Seq. ID No. 2084, Seq.  
ID No. 2086, Seq. ID No. 2094, Seq. ID No. 2096, Seq. ID No. 2098, Seq. ID No.  
2100, Seq. ID No. 2102, Seq. ID No. 2104, Seq. ID No. 2112, Seq. ID No. 2118,  
Seq. ID No. 2120, Seq. ID No. 2130, Seq. ID No. 2132, Seq. ID No. 2134, Seq.  
ID No. 2136, Seq. ID No. 2138, Seq. ID No. 2140, Seq. ID No. 2142, Seq. ID No.  
25 2144, Seq. ID No. 2146, Seq. ID No. 2148, Seq. ID No. 2154, Seq. ID No. 2162,  
Seq. ID No. 2164, Seq. ID No. 2166, Seq. ID No. 2168, Seq. ID No. 2170, Seq.  
ID No. 2176, Seq. ID No. 2180, Seq. ID No. 2182, Seq. ID No. 2184, Seq. ID No.  
2186, Seq. ID No. 2190, Seq. ID No. 2194, Seq. ID No. 2196, Seq. ID No. 2198,  
Seq. ID No. 2200, Seq. ID No. 2202, Seq. ID No. 2204, Seq. ID No. 2208, Seq.  
30 ID No. 2210, Seq. ID No. 2212, Seq. ID No. 2214, Seq. ID No. 2216, Seq. ID No.  
2218, Seq. ID No. 2220, Seq. ID No. 2222, Seq. ID No. 2224, Seq. ID No. 2226,  
Seq. ID No. 2228, Seq. ID No. 2230, Seq. ID No. 2232, Seq. ID No. 2234, Seq.  
ID No. 2236, Seq. ID No. 2242, Seq. ID No. 2244, Seq. ID No. 2248, Seq. ID No.

2254, Seq. ID No. 2258, Seq. ID No. 2262, Seq. ID No. 2264, Seq. ID No. 2266,  
Seq. ID No. 2268, Seq. ID No. 2270, Seq. ID No. 2274, Seq. ID No. 2276, Seq.  
ID No. 2278, Seq. ID No. 2280, Seq. ID No. 2282, Seq. ID No. 2286, Seq. ID No.  
2288, Seq. ID No. 2298, Seq. ID No. 2300, Seq. ID No. 2302, Seq. ID No. 2310,  
5 Seq. ID No. 2312, Seq. ID No. 2314, Seq. ID No. 2316, Seq. ID No. 2332, Seq.  
ID No. 2336, Seq. ID No. 2338, Seq. ID No. 2340, Seq. ID No. 2342, Seq. ID No.  
2346, Seq. ID No. 2360, Seq. ID No. 2362, Seq. ID No. 2364, Seq. ID No. 2370,  
Seq. ID No. 2374, Seq. ID No. 2378, Seq. ID No. 2380, Seq. ID No. 2382, Seq.  
ID No. 2384, Seq. ID No. 2386, Seq. ID No. 2396, Seq. ID No. 2398, Seq. ID No.  
10 2400, Seq. ID No. 2402, Seq. ID No. 2404, Seq. ID No. 2406, Seq. ID No. 2410,  
Seq. ID No. 2412, Seq. ID No. 2414, Seq. ID No. 2416, Seq. ID No. 2418, Seq.  
ID No. 2424, Seq. ID No. 2432, Seq. ID No. 2436, Seq. ID No. 2438, Seq. ID No.  
2440, Seq. ID No. 2442, Seq. ID No. 2444, Seq. ID No. 2446, Seq. ID No. 2448,  
Seq. ID No. 2452, Seq. ID No. 2454, Seq. ID No. 2456, Seq. ID No. 2458, Seq.  
15 ID No. 2462, Seq. ID No. 2464, Seq. ID No. 2466, Seq. ID No. 2468, Seq. ID No.  
2470, Seq. ID No. 2472, Seq. ID No. 2474, Seq. ID No. 2476, Seq. ID No. 2478,  
Seq. ID No. 2480, Seq. ID No. 2482, Seq. ID No. 2484, Seq. ID No. 2486, Seq.  
ID No. 2496, Seq. ID No. 2506, Seq. ID No. 2510, Seq. ID No. 2512, Seq. ID No.  
2514, Seq. ID No. 2520, Seq. ID No. 2522, Seq. ID No. 2530, Seq. ID No. 2540,  
20 Seq. ID No. 2548, Seq. ID No. 2550, Seq. ID No. 2552, Seq. ID No. 2554, Seq.  
ID No. 2560, Seq. ID No. 2562, Seq. ID No. 2564, Seq. ID No. 2568, Seq. ID No.  
2574, Seq. ID No. 2576, Seq. ID No. 2578, Seq. ID No. 2580, Seq. ID No. 2582,  
Seq. ID No. 2586, Seq. ID No. 2588, Seq. ID No. 2590, Seq. ID No. 2594, Seq.  
ID No. 2596, Seq. ID No. 2604, Seq. ID No. 2606, Seq. ID No. 2610, Seq. ID No.  
25 2614, Seq. ID No. 2616, Seq. ID No. 2618, Seq. ID No. 2620, Seq. ID No. 2624,  
Seq. ID No. 2626, Seq. ID No. 2632, Seq. ID No. 2634, Seq. ID No. 2636, Seq.  
ID No. 2638, Seq. ID No. 2640, Seq. ID No. 2642, Seq. ID No. 2644, Seq. ID No.  
2646, Seq. ID No. 2648, Seq. ID No. 2650, Seq. ID No. 2654, Seq. ID No. 2656,  
Seq. ID No. 2658, Seq. ID No. 2660, Seq. ID No. 2662, Seq. ID No. 2664, Seq.  
30 ID No. 2666, Seq. ID No. 2668, Seq. ID No. 2670, Seq. ID No. 2672, Seq. ID No.  
2674, Seq. ID No. 2676, Seq. ID No. 2678, Seq. ID No. 2686, Seq. ID No. 2688,  
Seq. ID No. 2690, Seq. ID No. 2710, Seq. ID No. 2712, Seq. ID No. 2714, Seq.  
ID No. 2716, Seq. ID No. 2720, Seq. ID No. 2722, Seq. ID No. 2724, Seq. ID No.

2726, Seq. ID No. 2728, Seq. ID No. 2736, Seq. ID No. 2738, Seq. ID No. 2740,  
Seq. ID No. 2742, Seq. ID No. 2744, Seq. ID No. 2746, Seq. ID No. 2748, Seq.  
ID No. 2750, Seq. ID No. 2752, Seq. ID No. 2754, Seq. ID No. 2756, Seq. ID No.  
2758, Seq. ID No. 2760, Seq. ID No. 2762, Seq. ID No. 2764, Seq. ID No. 2766,  
5 Seq. ID No. 2768, Seq. ID No. 2770, Seq. ID No. 2772, Seq. ID No. 2774, Seq.  
ID No. 2776, Seq. ID No. 2778, Seq. ID No. 2780, Seq. ID No. 2782, Seq. ID No.  
2788, Seq. ID No. 2790, Seq. ID No. 2792, Seq. ID No. 2794, Seq. ID No. 2796,  
Seq. ID No. 2798, Seq. ID No. 2800, Seq. ID No. 2804, Seq. ID No. 2806, Seq.  
ID No. 2808, Seq. ID No. 2812, Seq. ID No. 2818, Seq. ID No. 2826, Seq. ID No.  
10 2828, Seq. ID No. 2830, Seq. ID No. 2844, Seq. ID No. 2848, Seq. ID No. 2850,  
Seq. ID No. 2852, Seq. ID No. 2858, Seq. ID No. 2864, Seq. ID No. 2866, Seq.  
ID No. 2868, Seq. ID No. 2870, Seq. ID No. 2872, Seq. ID No. 2876, Seq. ID No.  
2878, Seq. ID No. 2880, Seq. ID No. 2884, Seq. ID No. 2886, Seq. ID No. 2888,  
Seq. ID No. 2890, Seq. ID No. 2892, Seq. ID No. 2896, Seq. ID No. 2898, Seq.  
15 ID No. 2900, Seq. ID No. 2902, Seq. ID No. 2904, Seq. ID No. 2908, Seq. ID No.  
2910, Seq. ID No. 2912, Seq. ID No. 2914, Seq. ID No. 2916, Seq. ID No. 2918,  
Seq. ID No. 2920, Seq. ID No. 2922, Seq. ID No. 2924, Seq. ID No. 2926, Seq.  
ID No. 2928, Seq. ID No. 2930, Seq. ID No. 2932, Seq. ID No. 2934, Seq. ID No.  
2944, Seq. ID No. 2946, Seq. ID No. 2954, Seq. ID No. 2956, Seq. ID No. 2958,  
20 Seq. ID No. 2960, Seq. ID No. 2962, Seq. ID No. 2964, Seq. ID No. 2966, Seq.  
ID No. 2968, Seq. ID No. 2972, Seq. ID No. 2980, Seq. ID No. 2986, Seq. ID No.  
2990, Seq. ID No. 2994, Seq. ID No. 3000, Seq. ID No. 3002, Seq. ID No. 3004,  
Seq. ID No. 3016, Seq. ID No. 3018, Seq. ID No. 3020, Seq. ID No. 3022, Seq.  
ID No. 3034, Seq. ID No. 3036, Seq. ID No. 3038, Seq. ID No. 3040, Seq. ID No.  
25 3042, Seq. ID No. 3046, Seq. ID No. 3048, Seq. ID No. 3050, Seq. ID No. 3052,  
Seq. ID No. 3054, Seq. ID No. 3058, Seq. ID No. 3060, Seq. ID No. 3062, Seq.  
ID No. 3066, Seq. ID No. 3068, Seq. ID No. 3070, Seq. ID No. 3080, Seq. ID No.  
3082, Seq. ID No. 3084, Seq. ID No. 3086, Seq. ID No. 3088, Seq. ID No. 3090,  
Seq. ID No. 3092, Seq. ID No. 3094, Seq. ID No. 3096, Seq. ID No. 3098, Seq.  
30 ID No. 3100, Seq. ID No. 3102, Seq. ID No. 3104, Seq. ID No. 3106, Seq. ID No.  
3108, Seq. ID No. 3110, Seq. ID No. 3112, Seq. ID No. 3114, Seq. ID No. 3116,  
Seq. ID No. 3118, Seq. ID No. 3126, Seq. ID No. 3128, Seq. ID No. 3130, Seq.  
ID No. 3132, Seq. ID No. 3134, Seq. ID No. 3136, Seq. ID No. 3138, Seq. ID No.

3140, Seq. ID No. 3142, Seq. ID No. 3144, Seq. ID No. 3148, Seq. ID No. 3150,  
Seq. ID No. 3152, Seq. ID No. 3154, Seq. ID No. 3160, Seq. ID No. 3162, Seq.  
ID No. 3168, Seq. ID No. 3170, Seq. ID No. 3172, Seq. ID No. 3176, Seq. ID No.  
3178, Seq. ID No. 3180, Seq. ID No. 3182, Seq. ID No. 3186, Seq. ID No. 3188,  
5 Seq. ID No. 3190, Seq. ID No. 3192, Seq. ID No. 3196, Seq. ID No. 3198, Seq.  
ID No. 3200, Seq. ID No. 3204, Seq. ID No. 3206, Seq. ID No. 3208, Seq. ID No.  
3210, Seq. ID No. 3212, Seq. ID No. 3222, Seq. ID No. 3224, Seq. ID No. 3226,  
Seq. ID No. 3228, Seq. ID No. 3230, Seq. ID No. 3232, Seq. ID No. 3234, Seq.  
ID No. 3236, Seq. ID No. 3238, Seq. ID No. 3240, Seq. ID No. 3248, Seq. ID No.  
10 3252, Seq. ID No. 3254, Seq. ID No. 3260, Seq. ID No. 3266, Seq. ID No. 3268,  
Seq. ID No. 3272, Seq. ID No. 3274, Seq. ID No. 3280, Seq. ID No. 3282, Seq.  
ID No. 3284, Seq. ID No. 3286, Seq. ID No. 3288, Seq. ID No. 3290, Seq. ID No.  
3292, Seq. ID No. 3294, Seq. ID No. 3296, Seq. ID No. 3300, Seq. ID No. 3302,  
Seq. ID No. 3304, Seq. ID No. 3306, Seq. ID No. 3308, Seq. ID No. 3310, Seq.  
15 ID No. 3312, Seq. ID No. 3314, Seq. ID No. 3316, Seq. ID No. 3320, Seq. ID No.  
3322, Seq. ID No. 3328, Seq. ID No. 3330, Seq. ID No. 3334, Seq. ID No. 3342,  
Seq. ID No. 3344, Seq. ID No. 3346, Seq. ID No. 3348, Seq. ID No. 3362, Seq.  
ID No. 3364, Seq. ID No. 3366, Seq. ID No. 3368, Seq. ID No. 3370, Seq. ID No.  
3372, Seq. ID No. 3374, Seq. ID No. 3380, Seq. ID No. 3382, Seq. ID No. 3384,  
20 Seq. ID No. 3386, Seq. ID No. 3388, Seq. ID No. 3394, Seq. ID No. 3398, Seq.  
ID No. 3400, Seq. ID No. 3402, Seq. ID No. 3404, Seq. ID No. 3408, Seq. ID No.  
3410, Seq. ID No. 3412, Seq. ID No. 3414, Seq. ID No. 3418, Seq. ID No. 3420,  
Seq. ID No. 3424, Seq. ID No. 3430, Seq. ID No. 3432, Seq. ID No. 3436, Seq.  
ID No. 3438, Seq. ID No. 3440, Seq. ID No. 3444, Seq. ID No. 3446, Seq. ID No.  
25 3448, Seq. ID No. 3460, Seq. ID No. 3462, Seq. ID No. 3466, Seq. ID No. 3468,  
Seq. ID No. 3470, Seq. ID No. 3472, Seq. ID No. 3474, Seq. ID No. 3476, Seq.  
ID No. 3478, Seq. ID No. 3480, Seq. ID No. 3484, Seq. ID No. 3486, Seq. ID No.  
3488, Seq. ID No. 3490, Seq. ID No. 3496, Seq. ID No. 3498, Seq. ID No. 3500,  
Seq. ID No. 3502, Seq. ID No. 3508, Seq. ID No. 3510, Seq. ID No. 3512, Seq.  
30 ID No. 3514, Seq. ID No. 3516, Seq. ID No. 3522, Seq. ID No. 3524, Seq. ID No.  
3526, Seq. ID No. 3530, Seq. ID No. 3534, Seq. ID No. 3536, Seq. ID No. 3538,  
Seq. ID No. 3542, Seq. ID No. 3544, Seq. ID No. 3546, Seq. ID No. 3548, Seq.  
ID No. 3550, Seq. ID No. 3552, Seq. ID No. 3554, Seq. ID No. 3556, Seq. ID No.

3558, Seq. ID No. 3560, Seq. ID No. 3564, Seq. ID No. 3566, Seq. ID No. 3568,  
Seq. ID No. 3570, Seq. ID No. 3572, Seq. ID No. 3576, Seq. ID No. 3578, Seq.  
ID No. 3580, Seq. ID No. 3584, Seq. ID No. 3586, Seq. ID No. 3590, Seq. ID No.  
3592, Seq. ID No. 3598, Seq. ID No. 3600, Seq. ID No. 3602, Seq. ID No. 3604,  
5 Seq. ID No. 3606, Seq. ID No. 3608, Seq. ID No. 3610, Seq. ID No. 3614, Seq.  
ID No. 3616, Seq. ID No. 3624, Seq. ID No. 3628, Seq. ID No. 3632, Seq. ID No.  
3634, Seq. ID No. 3638, Seq. ID No. 3640, Seq. ID No. 3642, Seq. ID No. 3644,  
Seq. ID No. 3646, Seq. ID No. 3648, Seq. ID No. 3650, Seq. ID No. 3652, Seq.  
ID No. 3654, Seq. ID No. 3656, Seq. ID No. 3658, Seq. ID No. 3660, Seq. ID No.  
10 3662, Seq. ID No. 3664, Seq. ID No. 3666, Seq. ID No. 3668, Seq. ID No. 3670,  
Seq. ID No. 3672, Seq. ID No. 3674, Seq. ID No. 3676, Seq. ID No. 3682, Seq.  
ID No. 3684, Seq. ID No. 3686, Seq. ID No. 3688, Seq. ID No. 3692, Seq. ID No.  
3694, Seq. ID No. 3696, Seq. ID No. 3698, Seq. ID No. 3700, Seq. ID No. 3702,  
Seq. ID No. 3704, Seq. ID No. 3706, Seq. ID No. 3708, Seq. ID No. 3710, Seq.  
15 ID No. 3712, Seq. ID No. 3714, Seq. ID No. 3716, Seq. ID No. 3720, Seq. ID No.  
3722, Seq. ID No. 3726, Seq. ID No. 3730, Seq. ID No. 3732, Seq. ID No. 3734,  
Seq. ID No. 3736, Seq. ID No. 3738, Seq. ID No. 3740, Seq. ID No. 3744, Seq.  
ID No. 3748, Seq. ID No. 3750, Seq. ID No. 3752, Seq. ID No. 3760, Seq. ID No.  
3768, Seq. ID No. 3770, Seq. ID No. 3772, Seq. ID No. 3774, Seq. ID No. 3776,  
20 Seq. ID No. 3778, Seq. ID No. 3780, Seq. ID No. 3786, Seq. ID No. 3788, Seq.  
ID No. 3790, Seq. ID No. 3792, Seq. ID No. 3796, Seq. ID No. 3798, Seq. ID No.  
3802, Seq. ID No. 3804, Seq. ID No. 3806, Seq. ID No. 3810, Seq. ID No. 3812,  
Seq. ID No. 3820, Seq. ID No. 3822, Seq. ID No. 3824, Seq. ID No. 3826, Seq.  
ID No. 3828, Seq. ID No. 3830, Seq. ID No. 3832, Seq. ID No. 3834, Seq. ID No.  
25 3836, Seq. ID No. 3842, Seq. ID No. 3844, Seq. ID No. 3846, Seq. ID No. 3848,  
Seq. ID No. 3856, Seq. ID No. 3858, Seq. ID No. 3868, Seq. ID No. 3870, Seq.  
ID No. 3872, Seq. ID No. 3874, Seq. ID No. 3876, Seq. ID No. 3878, Seq. ID No.  
3882, Seq. ID No. 3884, Seq. ID No. 3886, Seq. ID No. 3888, Seq. ID No. 3894,  
Seq. ID No. 3898, Seq. ID No. 3900, Seq. ID No. 3902, Seq. ID No. 3906, Seq.  
30 ID No. 3908, Seq. ID No. 3910, Seq. ID No. 3912, Seq. ID No. 3914, Seq. ID No.  
3918, Seq. ID No. 3920, Seq. ID No. 3922, Seq. ID No. 3928, Seq. ID No. 3930,  
Seq. ID No. 3932, Seq. ID No. 3934, Seq. ID No. 3936, Seq. ID No. 3938, Seq.  
ID No. 3940, Seq. ID No. 3942, Seq. ID No. 3944, Seq. ID No. 3946, Seq. ID No.

3948, Seq. ID No. 3950, Seq. ID No. 3952, Seq. ID No. 3954, Seq. ID No. 3956,  
Seq. ID No. 3958, Seq. ID No. 3962, Seq. ID No. 3966, Seq. ID No. 3968, Seq.  
ID No. 3970, Seq. ID No. 3972, Seq. ID No. 3978, Seq. ID No. 3980, Seq. ID No.  
3982, Seq. ID No. 3984, Seq. ID No. 3986, Seq. ID No. 3988, Seq. ID No. 3990,  
5 Seq. ID No. 3992, Seq. ID No. 4000, Seq. ID No. 4002, Seq. ID No. 4004, Seq.  
ID No. 4012, Seq. ID No. 4014, Seq. ID No. 4016, Seq. ID No. 4018, Seq. ID No.  
4020, Seq. ID No. 4022, Seq. ID No. 4024, Seq. ID No. 4030, Seq. ID No. 4032,  
Seq. ID No. 4034, Seq. ID No. 4036, Seq. ID No. 4038, Seq. ID No. 4052, Seq.  
ID No. 4054, Seq. ID No. 4056, Seq. ID No. 4058, Seq. ID No. 4060, Seq. ID No.  
10 4064, Seq. ID No. 4066, Seq. ID No. 4068, Seq. ID No. 4070, Seq. ID No. 4076,  
Seq. ID No. 4078, Seq. ID No. 4086, Seq. ID No. 4088, Seq. ID No. 4090, Seq.  
ID No. 4092, Seq. ID No. 4094, Seq. ID No. 4096, Seq. ID No. 4098, Seq. ID No.  
4100, Seq. ID No. 4106, Seq. ID No. 4108, Seq. ID No. 4110, Seq. ID No. 4114,  
Seq. ID No. 4116, Seq. ID No. 4118, Seq. ID No. 4120, Seq. ID No. 4122, Seq.  
15 ID No. 4124, Seq. ID No. 4126, Seq. ID No. 4128, Seq. ID No. 4130, Seq. ID No.  
4132, Seq. ID No. 4148, Seq. ID No. 4150, Seq. ID No. 4156, Seq. ID No. 4158,  
Seq. ID No. 4160, Seq. ID No. 4162, Seq. ID No. 4164, Seq. ID No. 4166, Seq.  
ID No. 4168, Seq. ID No. 4170, Seq. ID No. 4172, Seq. ID No. 4174, Seq. ID No.  
4176, Seq. ID No. 4178, Seq. ID No. 4180, Seq. ID No. 4184, Seq. ID No. 4186,  
20 Seq. ID No. 4188, Seq. ID No. 4190, Seq. ID No. 4192, Seq. ID No. 4194, Seq.  
ID No. 4196, Seq. ID No. 4198, Seq. ID No. 4200, Seq. ID No. 4202, Seq. ID No.  
4204, Seq. ID No. 4206, Seq. ID No. 4208, Seq. ID No. 4210, Seq. ID No. 4212,  
Seq. ID No. 4214, Seq. ID No. 4216, Seq. ID No. 4218, Seq. ID No. 4220, Seq.  
ID No. 4230, Seq. ID No. 4236, Seq. ID No. 4238, Seq. ID No. 4240, Seq. ID No.  
25 4244, Seq. ID No. 4246, Seq. ID No. 4250, Seq. ID No. 4252, Seq. ID No. 4256,  
Seq. ID No. 4268, Seq. ID No. 4272, Seq. ID No. 4274, Seq. ID No. 4278, Seq.  
ID No. 4280, Seq. ID No. 4282, Seq. ID No. 4284, Seq. ID No. 4290, Seq. ID No.  
4292, Seq. ID No. 4294, Seq. ID No. 4296, Seq. ID No. 4300, Seq. ID No. 4302,  
Seq. ID No. 4304, Seq. ID No. 4306, Seq. ID No. 4310, Seq. ID No. 4316, Seq.  
30 ID No. 4318, Seq. ID No. 4320, Seq. ID No. 4322, Seq. ID No. 4324, Seq. ID No.  
4326, Seq. ID No. 4328, Seq. ID No. 4330, Seq. ID No. 4332, Seq. ID No. 4334,  
Seq. ID No. 4336, Seq. ID No. 4338, Seq. ID No. 4340, Seq. ID No. 4342, Seq.  
ID No. 4346, Seq. ID No. 4348, Seq. ID No. 4350, Seq. ID No. 4352, Seq. ID No.

4354, Seq. ID No. 4356, Seq. ID No. 4358, Seq. ID No. 4360, Seq. ID No. 4362,  
Seq. ID No. 4364, Seq. ID No. 4366, Seq. ID No. 4368, Seq. ID No. 4370, Seq.  
ID No. 4372, Seq. ID No. 4374, Seq. ID No. 4376, Seq. ID No. 4378, Seq. ID No.  
4382, Seq. ID No. 4384, Seq. ID No. 4388, Seq. ID No. 4394, Seq. ID No. 4396,  
5 Seq. ID No. 4398, Seq. ID No. 4402, Seq. ID No. 4406, Seq. ID No. 4408, Seq.  
ID No. 4410, Seq. ID No. 4412, Seq. ID No. 4414, Seq. ID No. 4416, Seq. ID No.  
4418, Seq. ID No. 4420, Seq. ID No. 4422, Seq. ID No. 4424, Seq. ID No. 4426,  
Seq. ID No. 4428, Seq. ID No. 4430, Seq. ID No. 4432, Seq. ID No. 4434, Seq.  
ID No. 4436, Seq. ID No. 4444, Seq. ID No. 4446, Seq. ID No. 4448, Seq. ID No.  
10 4450, Seq. ID No. 4452, Seq. ID No. 4454, Seq. ID No. 4456, Seq. ID No. 4458,  
Seq. ID No. 4460, Seq. ID No. 4462, Seq. ID No. 4464, Seq. ID No. 4466, Seq.  
ID No. 4468, Seq. ID No. 4472, Seq. ID No. 4476, Seq. ID No. 4478, Seq. ID No.  
4480, Seq. ID No. 4488, Seq. ID No. 4490, Seq. ID No. 4492, Seq. ID No. 4500,  
Seq. ID No. 4502, Seq. ID No. 4504, Seq. ID No. 4506, Seq. ID No. 4508, Seq.  
15 ID No. 4510, Seq. ID No. 4512, Seq. ID No. 4518, Seq. ID No. 4520, Seq. ID No.  
4522, Seq. ID No. 4524, Seq. ID No. 4526, Seq. ID No. 4532, Seq. ID No. 4536,  
Seq. ID No. 4538, Seq. ID No. 4540, Seq. ID No. 4542, Seq. ID No. 4544, Seq.  
ID No. 4546, Seq. ID No. 4548, Seq. ID No. 4550, Seq. ID No. 4552, Seq. ID No.  
4554, Seq. ID No. 4556, Seq. ID No. 4558, Seq. ID No. 4560, Seq. ID No. 4562,  
20 Seq. ID No. 4564, Seq. ID No. 4566, Seq. ID No. 4568, Seq. ID No. 4570, Seq.  
ID No. 4572, Seq. ID No. 4574, Seq. ID No. 4576, Seq. ID No. 4578, Seq. ID No.  
4580, Seq. ID No. 4582, Seq. ID No. 4584, Seq. ID No. 4586, Seq. ID No. 4592,  
Seq. ID No. 4594, Seq. ID No. 4596, Seq. ID No. 4598, Seq. ID No. 4600, Seq.  
ID No. 4602, Seq. ID No. 4604, Seq. ID No. 4606, Seq. ID No. 4608, Seq. ID No.  
25 4610, Seq. ID No. 4612, Seq. ID No. 4614, Seq. ID No. 4616, Seq. ID No. 4618,  
Seq. ID No. 4620, Seq. ID No. 4622, Seq. ID No. 4624, Seq. ID No. 4626, Seq.  
ID No. 4628, Seq. ID No. 4630, Seq. ID No. 4632, Seq. ID No. 4634, Seq. ID No.  
4636, Seq. ID No. 4638, Seq. ID No. 4646, Seq. ID No. 4648, Seq. ID No. 4650,  
Seq. ID No. 4652, Seq. ID No. 4654, Seq. ID No. 4656, Seq. ID No. 4658, Seq.  
30 ID No. 4662, Seq. ID No. 4664, Seq. ID No. 4666, Seq. ID No. 4668, Seq. ID No.  
4670, Seq. ID No. 4672, Seq. ID No. 4674, Seq. ID No. 4676, Seq. ID No. 4678,  
Seq. ID No. 4680, Seq. ID No. 4684, Seq. ID No. 4686, Seq. ID No. 4690, Seq.  
ID No. 4692, Seq. ID No. 4694, Seq. ID No. 4698, Seq. ID No. 4700, Seq. ID No.



4702, Seq. ID No. 4704, Seq. ID No. 4714, Seq. ID No. 4720, Seq. ID No. 4722,  
Seq. ID No. 4724, Seq. ID No. 4726, Seq. ID No. 4728, Seq. ID No. 4730, Seq.  
ID No. 4732, Seq. ID No. 4734, Seq. ID No. 4736, Seq. ID No. 4740, Seq. ID No.  
4742, Seq. ID No. 4744, Seq. ID No. 4746, Seq. ID No. 4748, Seq. ID No. 4750,  
5 Seq. ID No. 4752, Seq. ID No. 4754, Seq. ID No. 4756, Seq. ID No. 4758, Seq.  
ID No. 4762, Seq. ID No. 4764, Seq. ID No. 4766, Seq. ID No. 4768, Seq. ID No.  
4770, Seq. ID No. 4772, Seq. ID No. 4774, Seq. ID No. 4776, Seq. ID No. 4778,  
Seq. ID No. 4780, Seq. ID No. 4782, Seq. ID No. 4784, Seq. ID No. 4786, Seq.  
ID No. 4788, Seq. ID No. 4790, Seq. ID No. 4792, Seq. ID No. 4794, Seq. ID No.  
10 4796, Seq. ID No. 4798, Seq. ID No. 4800, Seq. ID No. 4802, Seq. ID No. 4804,  
Seq. ID No. 4806, Seq. ID No. 4808, Seq. ID No. 4810, Seq. ID No. 4812, Seq.  
ID No. 4816, Seq. ID No. 4818, Seq. ID No. 4820, Seq. ID No. 4822, Seq. ID No.  
4824, Seq. ID No. 4826, Seq. ID No. 4830, Seq. ID No. 4832, Seq. ID No. 4834,  
Seq. ID No. 4836, Seq. ID No. 4838, Seq. ID No. 4840, Seq. ID No. 4842, Seq.  
15 ID No. 4844, Seq. ID No. 4846, Seq. ID No. 4848, Seq. ID No. 4850, Seq. ID No.  
4852, Seq. ID No. 4856, Seq. ID No. 4858, Seq. ID No. 4860, Seq. ID No. 4862,  
Seq. ID No. 4866, Seq. ID No. 4868, Seq. ID No. 4878, Seq. ID No. 4880, Seq.  
ID No. 4882, Seq. ID No. 4884, Seq. ID No. 4886, Seq. ID No. 4888, Seq. ID No.  
4890, Seq. ID No. 4892, Seq. ID No. 4894, Seq. ID No. 4896, Seq. ID No. 4898,  
20 Seq. ID No. 4900, Seq. ID No. 4902, Seq. ID No. 4904, Seq. ID No. 4906, Seq.  
ID No. 4908, Seq. ID No. 4910, Seq. ID No. 4912, Seq. ID No. 4914, Seq. ID No.  
4916, Seq. ID No. 4918, Seq. ID No. 4926, Seq. ID No. 4928, Seq. ID No. 4934,  
Seq. ID No. 4936, Seq. ID No. 4938, Seq. ID No. 4940, Seq. ID No. 4942, Seq.  
ID No. 4944, Seq. ID No. 4946, Seq. ID No. 4948, Seq. ID No. 4954, Seq. ID No.  
25 4956, Seq. ID No. 4958, Seq. ID No. 4960, Seq. ID No. 4962, Seq. ID No. 4964,  
Seq. ID No. 4966, Seq. ID No. 4968, Seq. ID No. 4970, Seq. ID No. 4972, Seq.  
ID No. 4974, Seq. ID No. 4978, Seq. ID No. 4980, Seq. ID No. 4982, Seq. ID No.  
4984, Seq. ID No. 4986, Seq. ID No. 4990, Seq. ID No. 4992, Seq. ID No. 4994,  
Seq. ID No. 4996, Seq. ID No. 4998, Seq. ID No. 5002, Seq. ID No. 5004, Seq.  
30 ID No. 5006, Seq. ID No. 5008, Seq. ID No. 5010, Seq. ID No. 5012, Seq. ID No.  
5016, Seq. ID No. 5018, Seq. ID No. 5020, Seq. ID No. 5022, Seq. ID No. 5024,  
Seq. ID No. 5026, Seq. ID No. 5028, Seq. ID No. 5030, Seq. ID No. 5034, Seq.  
ID No. 5036, Seq. ID No. 5038, Seq. ID No. 5040, Seq. ID No. 5042, Seq. ID No.

5044, Seq. ID No. 5046, Seq. ID No. 5048, Seq. ID No. 5050, Seq. ID No. 5052,  
Seq. ID No. 5054, Seq. ID No. 5056, Seq. ID No. 5058, Seq. ID No. 5060, Seq.  
ID No. 5066, Seq. ID No. 5068, Seq. ID No. 5072, Seq. ID No. 5074, Seq. ID No.  
5076, Seq. ID No. 5078, Seq. ID No. 5080, Seq. ID No. 5082, Seq. ID No. 5084,  
Seq. ID No. 5088, Seq. ID No. 5090, Seq. ID No. 5092, Seq. ID No. 5094, Seq.  
ID No. 5096, Seq. ID No. 5098, Seq. ID No. 5100, Seq. ID No. 5102, Seq. ID No.  
5106, Seq. ID No. 5108, Seq. ID No. 5110, Seq. ID No. 5112, Seq. ID No. 5114,  
Seq. ID No. 5118, Seq. ID No. 5120, Seq. ID No. 5122, Seq. ID No. 5128, Seq.  
ID No. 5144, Seq. ID No. 5146, Seq. ID No. 5148, Seq. ID No. 5150, Seq. ID No.  
5152, Seq. ID No. 5154, Seq. ID No. 5156, Seq. ID No. 5158, Seq. ID No. 5162,  
Seq. ID No. 5164, Seq. ID No. 5168, Seq. ID No. 5170, Seq. ID No. 5172, Seq.  
ID No. 5174, Seq. ID No. 5178, Seq. ID No. 5180, Seq. ID No. 5182, Seq. ID No.  
5184, Seq. ID No. 5186, Seq. ID No. 5188, Seq. ID No. 5190, Seq. ID No. 5192,  
Seq. ID No. 5194, Seq. ID No. 5196, Seq. ID No. 5202, Seq. ID No. 5204, Seq.  
ID No. 5210, Seq. ID No. 5212, Seq. ID No. 5216, Seq. ID No. 5218, Seq. ID No.  
5222, Seq. ID No. 5226, Seq. ID No. 5228, Seq. ID No. 5230, Seq. ID No. 5232,  
Seq. ID No. 5234, Seq. ID No. 5236, Seq. ID No. 5238, Seq. ID No. 5240, Seq.  
ID No. 5242, Seq. ID No. 5244, Seq. ID No. 5246, Seq. ID No. 5248, Seq. ID No.  
5250, Seq. ID No. 5252, Seq. ID No. 5254, Seq. ID No. 5256, Seq. ID No. 5258,  
Seq. ID No. 5260, Seq. ID No. 5262, Seq. ID No. 5264, Seq. ID No. 5266, Seq.  
ID No. 5270, Seq. ID No. 5272, Seq. ID No. 5284, Seq. ID No. 5288, Seq. ID No.  
5290, Seq. ID No. 5292, Seq. ID No. 5294, Seq. ID No. 5296, Seq. ID No. 5298,  
Seq. ID No. 5300, Seq. ID No. 5302, Seq. ID No. 5304, Seq. ID No. 5306, Seq.  
ID No. 5308, Seq. ID No. 5310, Seq. ID No. 5312, Seq. ID No. 5314, Seq. ID No.  
5316, Seq. ID No. 5318, Seq. ID No. 5320, Seq. ID No. 5322, Seq. ID No. 5324,  
Seq. ID No. 5326, Seq. ID No. 5334, Seq. ID No. 5336, Seq. ID No. 5338, Seq.  
ID No. 5340, Seq. ID No. 5344, Seq. ID No. 5346, Seq. ID No. 5348, Seq. ID No.  
5350, Seq. ID No. 5352, Seq. ID No. 5354, Seq. ID No. 5356, Seq. ID No. 5358,  
Seq. ID No. 5360, Seq. ID No. 5362, Seq. ID No. 5364, Seq. ID No. 5366, Seq.  
ID No. 5368, Seq. ID No. 5370, Seq. ID No. 5372, Seq. ID No. 5374, Seq. ID No.  
5376, Seq. ID No. 5382, Seq. ID No. 5384, Seq. ID No. 5390, Seq. ID No. 5392,  
Seq. ID No. 5394, Seq. ID No. 5396, Seq. ID No. 5398, Seq. ID No. 5400, Seq.  
ID No. 5402, Seq. ID No. 5404, Seq. ID No. 5408, Seq. ID No. 5410, Seq. ID No.

5412, Seq. ID No. 5418, Seq. ID No. 5420, Seq. ID No. 5422, Seq. ID No. 5424,  
Seq. ID No. 5426, Seq. ID No. 5428, Seq. ID No. 5430, Seq. ID No. 5432, Seq.  
ID No. 5436, Seq. ID No. 5438, Seq. ID No. 5440, Seq. ID No. 5442, Seq. ID No.  
5444, Seq. ID No. 5446, Seq. ID No. 5448, Seq. ID No. 5450, Seq. ID No. 5452,  
5 Seq. ID No. 5456, Seq. ID No. 5458, Seq. ID No. 5468, Seq. ID No. 5470, Seq.  
ID No. 5472, Seq. ID No. 5474, Seq. ID No. 5476, Seq. ID No. 5478, Seq. ID No.  
5480, Seq. ID No. 5482, Seq. ID No. 5484, Seq. ID No. 5486, Seq. ID No. 5488,  
Seq. ID No. 5490, Seq. ID No. 5494, Seq. ID No. 5496, Seq. ID No. 5500, Seq.  
ID No. 5502, Seq. ID No. 5504, Seq. ID No. 5506, Seq. ID No. 5508, Seq. ID No.  
10 5512, Seq. ID No. 5520, Seq. ID No. 5522, Seq. ID No. 5524, Seq. ID No. 5528,  
Seq. ID No. 5536, Seq. ID No. 5538, Seq. ID No. 5540, Seq. ID No. 5542, Seq.  
ID No. 5548, Seq. ID No. 5550, Seq. ID No. 5552, Seq. ID No. 5554, Seq. ID No.  
5556, Seq. ID No. 5558, Seq. ID No. 5560, Seq. ID No. 5562, Seq. ID No. 5564,  
Seq. ID No. 5566, Seq. ID No. 5568, Seq. ID No. 5572, Seq. ID No. 5574, Seq.  
15 ID No. 5576, Seq. ID No. 5578, Seq. ID No. 5580, Seq. ID No. 5582, Seq. ID No.  
5584, Seq. ID No. 5586, Seq. ID No. 5600, Seq. ID No. 5602, Seq. ID No. 5604,  
Seq. ID No. 5606, Seq. ID No. 5608, Seq. ID No. 5614, Seq. ID No. 5616, Seq.  
ID No. 5618, Seq. ID No. 5620, Seq. ID No. 5628, Seq. ID No. 5630, Seq. ID No.  
5632, Seq. ID No. 5636, Seq. ID No. 5646, Seq. ID No. 5648, Seq. ID No. 5652,  
20 Seq. ID No. 5654, Seq. ID No. 5656, Seq. ID No. 5658, Seq. ID No. 5662, Seq.  
ID No. 5664, Seq. ID No. 5666, Seq. ID No. 5670, Seq. ID No. 5672, Seq. ID No.  
5674, Seq. ID No. 5676, Seq. ID No. 5678, Seq. ID No. 5680, Seq. ID No. 5692,  
Seq. ID No. 5694, Seq. ID No. 5696, Seq. ID No. 5698, Seq. ID No. 5702, Seq.  
ID No. 5708, Seq. ID No. 5714, Seq. ID No. 5716, Seq. ID No. 5718, Seq. ID No.  
25 5722, Seq. ID No. 5724, Seq. ID No. 5726, Seq. ID No. 5728, Seq. ID No. 5732,  
Seq. ID No. 5738, Seq. ID No. 5742, Seq. ID No. 5744, Seq. ID No. 5746, Seq.  
ID No. 5748, Seq. ID No. 5750, Seq. ID No. 5752, Seq. ID No. 5754, Seq. ID No.  
5756, Seq. ID No. 5758, Seq. ID No. 5760, Seq. ID No. 5762, Seq. ID No. 5770,  
Seq. ID No. 5774, Seq. ID No. 5776, Seq. ID No. 5778, Seq. ID No. 5780, Seq.  
30 ID No. 5782, Seq. ID No. 5788, Seq. ID No. 5790, Seq. ID No. 5794, Seq. ID No.  
5796, Seq. ID No. 5800, Seq. ID No. 5802, Seq. ID No. 5804, Seq. ID No. 5806,  
Seq. ID No. 5808, Seq. ID No. 5810, Seq. ID No. 5812, Seq. ID No. 5814, Seq.  
ID No. 5816, Seq. ID No. 5818, Seq. ID No. 5820, Seq. ID No. 5822, Seq. ID No.

5824, Seq. ID No. 5826, Seq. ID No. 5828, Seq. ID No. 5832, Seq. ID No. 5834,  
Seq. ID No. 5836, Seq. ID No. 5838, Seq. ID No. 5840, Seq. ID No. 5842, Seq.  
ID No. 5844, Seq. ID No. 5846, Seq. ID No. 5848, Seq. ID No. 5850, Seq. ID No.  
5852, Seq. ID No. 5854, Seq. ID No. 5856, Seq. ID No. 5858, Seq. ID No. 5860,  
5 Seq. ID No. 5862, Seq. ID No. 5864, Seq. ID No. 5866, Seq. ID No. 5868, Seq.  
ID No. 5870, Seq. ID No. 5872, Seq. ID No. 5874, Seq. ID No. 5876, Seq. ID No.  
5878, Seq. ID No. 5882, Seq. ID No. 5888, Seq. ID No. 5892, Seq. ID No. 5898,  
Seq. ID No. 5904, Seq. ID No. 5908, Seq. ID No. 5912, Seq. ID No. 5914, Seq.  
ID No. 5916, Seq. ID No. 5918, Seq. ID No. 5920, Seq. ID No. 5926, Seq. ID No.  
10 5932, Seq. ID No. 5934, Seq. ID No. 5936, Seq. ID No. 5938, Seq. ID No. 5942,  
Seq. ID No. 5944, Seq. ID No. 5946, Seq. ID No. 5948, Seq. ID No. 5950, Seq.  
ID No. 5952, Seq. ID No. 5954, Seq. ID No. 5956, Seq. ID No. 5958, Seq. ID No.  
5960, Seq. ID No. 5962, Seq. ID No. 5964, Seq. ID No. 5966, Seq. ID No. 5968,  
Seq. ID No. 5970, Seq. ID No. 5972, Seq. ID No. 5974, Seq. ID No. 5976, Seq.  
15 ID No. 5978, Seq. ID No. 5980, Seq. ID No. 5982, Seq. ID No. 5984, Seq. ID No.  
5986, Seq. ID No. 5988, Seq. ID No. 5990, Seq. ID No. 5992, Seq. ID No. 5994,  
Seq. ID No. 5996, Seq. ID No. 5998, Seq. ID No. 6000, Seq. ID No. 6002, Seq.  
ID No. 6004, Seq. ID No. 6006, Seq. ID No. 6008, Seq. ID No. 6010, Seq. ID No.  
6012, Seq. ID No. 6014, Seq. ID No. 6016, Seq. ID No. 6018, Seq. ID No. 6020,  
20 Seq. ID No. 6022, Seq. ID No. 6030, Seq. ID No. 6032, Seq. ID No. 6034, Seq.  
ID No. 6036, Seq. ID No. 6038, Seq. ID No. 6040, Seq. ID No. 6042, Seq. ID No.  
6046, Seq. ID No. 6050, Seq. ID No. 6052, Seq. ID No. 6056, Seq. ID No. 6058,  
Seq. ID No. 6062, Seq. ID No. 6066, Seq. ID No. 6070, Seq. ID No. 6072, Seq.  
ID No. 6074, Seq. ID No. 6076, Seq. ID No. 6078, Seq. ID No. 6080, Seq. ID No.  
25 6082, Seq. ID No. 6084, Seq. ID No. 6086, Seq. ID No. 6094, Seq. ID No. 6098,  
Seq. ID No. 6100, Seq. ID No. 6102, Seq. ID No. 6106, Seq. ID No. 6114, Seq.  
ID No. 6120, Seq. ID No. 6122, Seq. ID No. 6124, Seq. ID No. 6126, Seq. ID No.  
6128, Seq. ID No. 6130, Seq. ID No. 6132, Seq. ID No. 6134, Seq. ID No. 6140,  
Seq. ID No. 6142, Seq. ID No. 6144, Seq. ID No. 6146, Seq. ID No. 6148, Seq.  
30 ID No. 6150, Seq. ID No. 6152, Seq. ID No. 6154, Seq. ID No. 6156, Seq. ID No.  
6158, Seq. ID No. 6168, Seq. ID No. 6172, Seq. ID No. 6174, Seq. ID No. 6176,  
Seq. ID No. 6178, Seq. ID No. 6180, Seq. ID No. 6182, Seq. ID No. 6194, Seq.  
ID No. 6196, Seq. ID No. 6200, Seq. ID No. 6202, Seq. ID No. 6208, Seq. ID No.

6212, Seq. ID No. 6214, Seq. ID No. 6216, Seq. ID No. 6220, Seq. ID No. 6232,  
Seq. ID No. 6234, Seq. ID No. 6240, Seq. ID No. 6248, Seq. ID No. 6252, Seq.  
ID No. 6256, Seq. ID No. 6258, Seq. ID No. 6262, Seq. ID No. 6270, Seq. ID No.  
6272, Seq. ID No. 6278, Seq. ID No. 6280, Seq. ID No. 6282, Seq. ID No. 6288,  
5 Seq. ID No. 6292, Seq. ID No. 6294, Seq. ID No. 6296, Seq. ID No. 6298, Seq.  
ID No. 6300, Seq. ID No. 6306, Seq. ID No. 6308, Seq. ID No. 6310, Seq. ID No.  
6312, Seq. ID No. 6314, Seq. ID No. 6316, Seq. ID No. 6318, Seq. ID No. 6320,  
Seq. ID No. 6322, Seq. ID No. 6324, Seq. ID No. 6330, Seq. ID No. 6332, Seq.  
ID No. 6334, Seq. ID No. 6336, Seq. ID No. 6338, Seq. ID No. 6340, Seq. ID No.  
10 6342, Seq. ID No. 6344, Seq. ID No. 6346, Seq. ID No. 6348, Seq. ID No. 6350,  
Seq. ID No. 6352, Seq. ID No. 6354, Seq. ID No. 6356, Seq. ID No. 6358, Seq.  
ID No. 6360, Seq. ID No. 6362, Seq. ID No. 6368, Seq. ID No. 6370, Seq. ID No.  
6372, Seq. ID No. 6374, Seq. ID No. 6376, Seq. ID No. 6380, Seq. ID No. 6386,  
Seq. ID No. 6388, Seq. ID No. 6390, Seq. ID No. 6392, Seq. ID No. 6394, Seq.  
15 ID No. 6396, Seq. ID No. 6398, Seq. ID No. 6400, Seq. ID No. 6402, Seq. ID No.  
6404, Seq. ID No. 6406, Seq. ID No. 6408, Seq. ID No. 6410, Seq. ID No. 6412,  
Seq. ID No. 6414, Seq. ID No. 6418, Seq. ID No. 6420, Seq. ID No. 6422, Seq.  
ID No. 6424, Seq. ID No. 6434, Seq. ID No. 6436, Seq. ID No. 6438, Seq. ID No.  
6440, Seq. ID No. 6442, Seq. ID No. 6444, Seq. ID No. 6446, Seq. ID No. 6448,  
20 Seq. ID No. 6450, Seq. ID No. 6452, Seq. ID No. 6454, Seq. ID No. 6456, Seq.  
ID No. 6458, Seq. ID No. 6460, Seq. ID No. 6462, Seq. ID No. 6464, Seq. ID No.  
6466, Seq. ID No. 6468, Seq. ID No. 6470, Seq. ID No. 6472, Seq. ID No. 6476,  
Seq. ID No. 6478, Seq. ID No. 6482, Seq. ID No. 6484, Seq. ID No. 6486, Seq.  
ID No. 6488, Seq. ID No. 6490, Seq. ID No. 6492, Seq. ID No. 6494, Seq. ID No.  
25 6496, Seq. ID No. 6500, Seq. ID No. 6502, Seq. ID No. 6504, Seq. ID No. 6506,  
Seq. ID No. 6508, Seq. ID No. 6510, Seq. ID No. 6512, Seq. ID No. 6514, Seq.  
ID No. 6516, Seq. ID No. 6520, Seq. ID No. 6522, Seq. ID No. 6524, Seq. ID No.  
6526, Seq. ID No. 6528, Seq. ID No. 6530, Seq. ID No. 6532, Seq. ID No. 6534,  
Seq. ID No. 6536, Seq. ID No. 6538, Seq. ID No. 6540, Seq. ID No. 6546, Seq.  
30 ID No. 6548, Seq. ID No. 6550, Seq. ID No. 6552, Seq. ID No. 6554, Seq. ID No.  
6560, Seq. ID No. 6562, Seq. ID No. 6564, Seq. ID No. 6566, Seq. ID No. 6568,  
Seq. ID No. 6570, Seq. ID No. 6576, Seq. ID No. 6578, Seq. ID No. 6580, Seq.  
ID No. 6584, Seq. ID No. 6586, Seq. ID No. 6588, Seq. ID No. 6590, Seq. ID No.

6592, Seq. ID No. 6606, Seq. ID No. 6608, Seq. ID No. 6610, Seq. ID No. 6612, Seq. ID No. 6614, Seq. ID No. 6616, Seq. ID No. 6618, Seq. ID No. 6620, Seq. ID No. 6622, Seq. ID No. 6624, Seq. ID No. 6626, Seq. ID No. 6628, Seq. ID No. 6630, Seq. ID No. 6634, Seq. ID No. 6636, Seq. ID No. 6642, and Seq. ID No. 6648.

5

41. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is identified by BlastP analysis, and is selected from one of Seq. ID No. 10, Seq. ID No. 18, Seq. ID No. 46, Seq. ID No. 50, Seq. ID No. 54, Seq. ID No. 60, Seq. ID No. 90, Seq. ID No. 146, Seq. ID No. 158, Seq. ID No. 168, Seq. ID No. 172, Seq. ID No. 192, Seq. ID No. 216, Seq. ID No. 218, Seq. ID No. 226, Seq. ID No. 240, Seq. ID No. 254, Seq. ID No. 274, Seq. ID No. 278, Seq. ID No. 290, Seq. ID No. 330, Seq. ID No. 344, Seq. ID No. 346, Seq. ID No. 376, Seq. ID No. 502, Seq. ID No. 506, Seq. ID No. 512, Seq. ID No. 516, Seq. ID No. 530, Seq. ID No. 570, Seq. ID No. 576, Seq. ID No. 594, Seq. ID No. 596, Seq. ID No. 638, Seq. ID No. 660, Seq. ID No. 670, Seq. ID No. 676, Seq. ID No. 682, Seq. ID No. 730, Seq. ID No. 780, Seq. ID No. 820, Seq. ID No. 896, Seq. ID No. 922, Seq. ID No. 936, Seq. ID No. 956, Seq. ID No. 968, Seq. ID No. 986, Seq. ID No. 1018, Seq. ID No. 1040, Seq. ID No. 1076, Seq. ID No. 1090, Seq. ID No. 1138, Seq. ID No. 1224, Seq. ID No. 1242, Seq. ID No. 1316, Seq. ID No. 1332, Seq. ID No. 1370, Seq. ID No. 1460, Seq. ID No. 1518, Seq. ID No. 1562, Seq. ID No. 1564, Seq. ID No. 1568, Seq. ID No. 1572, Seq. ID No. 1574, Seq. ID No. 1602, Seq. ID No. 1608, Seq. ID No. 1614, Seq. ID No. 1620, Seq. ID No. 1642, Seq. ID No. 1648, Seq. ID No. 1654, Seq. ID No. 1658, Seq. ID No. 1666, Seq. ID No. 1700, Seq. ID No. 1714, Seq. ID No. 1752, Seq. ID No. 1772, Seq. ID No. 1786, Seq. ID No. 1790, Seq. ID No. 1792, Seq. ID No. 1798, Seq. ID No. 1812, Seq. ID No. 1818, Seq. ID No. 1820, Seq. ID No. 1822, Seq. ID No. 1872, Seq. ID No. 1896, Seq. ID No. 1906, Seq. ID No. 1914, Seq. ID No. 1920, Seq. ID No. 1924, Seq. ID No. 1966, Seq. ID No. 1972, Seq. ID No. 2000, Seq. ID No. 2048, Seq. ID No. 2056, Seq. ID No. 2092, Seq. ID No. 2094, Seq. ID No. 2116, Seq. ID No. 2120, Seq. ID No. 2128, Seq. ID No. 2166, Seq. ID No. 2180, Seq. ID No. 2208, Seq. ID No. 2224, Seq. ID No. 2228, Seq. ID No. 2242, Seq. ID No. 2254, Seq. ID No. 2264, Seq. ID No. 2270, Seq. ID No. 2276, Seq. ID No. 2302, Seq. ID No. 2316, Seq. ID No. 2330, Seq. ID No. 2334, Seq. ID No. 2344, Seq. ID No. 2346, Seq. ID No.

10

15

20

25

30

2364, Seq. ID No. 2374, Seq. ID No. 2392, Seq. ID No. 2418, Seq. ID No. 2430,  
Seq. ID No. 2466, Seq. ID No. 2476, Seq. ID No. 2484, Seq. ID No. 2514, Seq.  
ID No. 2526, Seq. ID No. 2590, Seq. ID No. 2614, Seq. ID No. 2652, Seq. ID No.  
2670, Seq. ID No. 2678, Seq. ID No. 2688, Seq. ID No. 2690, Seq. ID No. 2694,  
5 Seq. ID No. 2704, Seq. ID No. 2710, Seq. ID No. 2716, Seq. ID No. 2752, Seq.  
ID No. 2754, Seq. ID No. 2768, Seq. ID No. 2788, Seq. ID No. 2792, Seq. ID No.  
2804, Seq. ID No. 2868, Seq. ID No. 2872, Seq. ID No. 2908, Seq. ID No. 2920,  
Seq. ID No. 2922, Seq. ID No. 2924, Seq. ID No. 2928, Seq. ID No. 2934, Seq.  
ID No. 2958, Seq. ID No. 2980, Seq. ID No. 3000, Seq. ID No. 3006, Seq. ID No.  
10 3020, Seq. ID No. 3032, Seq. ID No. 3036, Seq. ID No. 3056, Seq. ID No. 3068,  
Seq. ID No. 3086, Seq. ID No. 3166, Seq. ID No. 3184, Seq. ID No. 3190, Seq.  
ID No. 3198, Seq. ID No. 3212, Seq. ID No. 3252, Seq. ID No. 3258, Seq. ID No.  
3260, Seq. ID No. 3298, Seq. ID No. 3320, Seq. ID No. 3324, Seq. ID No. 3336,  
Seq. ID No. 3338, Seq. ID No. 3356, Seq. ID No. 3360, Seq. ID No. 3378, Seq.  
15 ID No. 3398, Seq. ID No. 3406, Seq. ID No. 3416, Seq. ID No. 3426, Seq. ID No.  
3428, Seq. ID No. 3462, Seq. ID No. 3464, Seq. ID No. 3488, Seq. ID No. 3494,  
Seq. ID No. 3498, Seq. ID No. 3508, Seq. ID No. 3520, Seq. ID No. 3522, Seq.  
ID No. 3530, Seq. ID No. 3536, Seq. ID No. 3630, Seq. ID No. 3636, Seq. ID No.  
3728, Seq. ID No. 3760, Seq. ID No. 3772, Seq. ID No. 3794, Seq. ID No. 3840,  
20 Seq. ID No. 3852, Seq. ID No. 3864, Seq. ID No. 3866, Seq. ID No. 3884, Seq.  
ID No. 3892, Seq. ID No. 3914, Seq. ID No. 3926, Seq. ID No. 3930, Seq. ID No.  
3976, Seq. ID No. 3982, Seq. ID No. 4028, Seq. ID No. 4040, Seq. ID No. 4062,  
Seq. ID No. 4074, Seq. ID No. 4082, Seq. ID No. 4104, Seq. ID No. 4112, Seq.  
ID No. 4138, Seq. ID No. 4226, Seq. ID No. 4248, Seq. ID No. 4344, Seq. ID No.  
25 4380, Seq. ID No. 4390, Seq. ID No. 4470, Seq. ID No. 4474, Seq. ID No. 4482,  
Seq. ID No. 4486, Seq. ID No. 4494, Seq. ID No. 4530, Seq. ID No. 4644, Seq.  
ID No. 4706, Seq. ID No. 4714, Seq. ID No. 4718, Seq. ID No. 4814, Seq. ID No.  
4816, Seq. ID No. 4826, Seq. ID No. 4828, Seq. ID No. 4834, Seq. ID No. 4838,  
Seq. ID No. 4852, Seq. ID No. 4864, Seq. ID No. 4876, Seq. ID No. 4880, Seq.  
30 ID No. 4894, Seq. ID No. 4902, Seq. ID No. 4920, Seq. ID No. 4932, Seq. ID No.  
4960, Seq. ID No. 4964, Seq. ID No. 4986, Seq. ID No. 5114, Seq. ID No. 5116,  
Seq. ID No. 5118, Seq. ID No. 5126, Seq. ID No. 5142, Seq. ID No. 5184, Seq.  
ID No. 5202, Seq. ID No. 5206, Seq. ID No. 5214, Seq. ID No. 5220, Seq. ID No.

5280, Seq. ID No. 5286, Seq. ID No. 5332, Seq. ID No. 5382, Seq. ID No. 5390, Seq. ID No. 5406, Seq. ID No. 5412, Seq. ID No. 5420, Seq. ID No. 5434, Seq. ID No. 5464, Seq. ID No. 5478, Seq. ID No. 5492, Seq. ID No. 5510, Seq. ID No. 5514, Seq. ID No. 5526, Seq. ID No. 5530, Seq. ID No. 5538, Seq. ID No. 5568, Seq. ID No. 5600, Seq. ID No. 5622, Seq. ID No. 5638, Seq. ID No. 5700, Seq. ID No. 5724, Seq. ID No. 5734, Seq. ID No. 5762, Seq. ID No. 5792, Seq. ID No. 5896, Seq. ID No. 5902, Seq. ID No. 5904, Seq. ID No. 5910, Seq. ID No. 5914, Seq. ID No. 5920, Seq. ID No. 5930, Seq. ID No. 5940, Seq. ID No. 6002, Seq. ID No. 6044, Seq. ID No. 6054, Seq. ID No. 6058, Seq. ID No. 6090, Seq. ID No. 6096, Seq. ID No. 6104, Seq. ID No. 6112, Seq. ID No. 6118, Seq. ID No. 6166, Seq. ID No. 6170, Seq. ID No. 6186, Seq. ID No. 6192, Seq. ID No. 6210, Seq. ID No. 6230, Seq. ID No. 6258, Seq. ID No. 6264, Seq. ID No. 6272, Seq. ID No. 6276, Seq. ID No. 6290, Seq. ID No. 6304, Seq. ID No. 6366, Seq. ID No. 6370, Seq. ID No. 6384, and Seq. ID No. 6416.

42. The *Alloioococcus otitidis* polypeptide of claim 36, wherein the polypeptide is identified by Pfam analysis, and is selected from one of Seq. ID No. 90, Seq. ID No. 146, Seq. ID No. 156, Seq. ID No. 168, Seq. ID No. 174, Seq. ID No. 192, Seq. ID No. 216, Seq. ID No. 220, Seq. ID No. 222, Seq. ID No. 224, Seq. ID No. 226, Seq. ID No. 234, Seq. ID No. 240, Seq. ID No. 252, Seq. ID No. 254, Seq. ID No. 272, Seq. ID No. 292, Seq. ID No. 332, Seq. ID No. 342, Seq. ID No. 346, Seq. ID No. 376, Seq. ID No. 502, Seq. ID No. 506, Seq. ID No. 512, Seq. ID No. 530, Seq. ID No. 568, Seq. ID No. 570, Seq. ID No. 576, Seq. ID No. 594, Seq. ID No. 596, Seq. ID No. 602, Seq. ID No. 638, Seq. ID No. 650, Seq. ID No. 662, Seq. ID No. 670, Seq. ID No. 676, Seq. ID No. 682, Seq. ID No. 684, Seq. ID No. 730, Seq. ID No. 754, Seq. ID No. 780, Seq. ID No. 828, Seq. ID No. 840, Seq. ID No. 896, Seq. ID No. 940, Seq. ID No. 970, Seq. ID No. 986, Seq. ID No. 1016, Seq. ID No. 1040, Seq. ID No. 1076, Seq. ID No. 1138, Seq. ID No. 1156, Seq. ID No. 1164, Seq. ID No. 1176, Seq. ID No. 1224, Seq. ID No. 1232, Seq. ID No. 1238, Seq. ID No. 1242, Seq. ID No. 1262, Seq. ID No. 1332, Seq. ID No. 1340, Seq. ID No. 1370, Seq. ID No. 1478, Seq. ID No. 1518, Seq. ID No. 1532, Seq. ID No. 1540, Seq. ID No. 1550, Seq. ID No. 1564, Seq. ID No. 1568, Seq. ID No. 1572, Seq. ID No. 1574, Seq. ID No. 1590, Seq. ID No. 1596, Seq. ID No.



1648, Seq. ID No. 1658, Seq. ID No. 1772, Seq. ID No. 1786, Seq. ID No. 1790,  
Seq. ID No. 1820, Seq. ID No. 1822, Seq. ID No. 1970, Seq. ID No. 2016, Seq.  
ID No. 2048, Seq. ID No. 2088, Seq. ID No. 2090, Seq. ID No. 2094, Seq. ID No.  
2116, Seq. ID No. 2118, Seq. ID No. 2128, Seq. ID No. 2142, Seq. ID No. 2180,  
5 Seq. ID No. 2208, Seq. ID No. 2224, Seq. ID No. 2254, Seq. ID No. 2276, Seq.  
ID No. 2302, Seq. ID No. 2316, Seq. ID No. 2330, Seq. ID No. 2344, Seq. ID No.  
2350, Seq. ID No. 2364, Seq. ID No. 2382, Seq. ID No. 2392, Seq. ID No. 2418,  
Seq. ID No. 2422, Seq. ID No. 2424, Seq. ID No. 2430, Seq. ID No. 2482, Seq.  
ID No. 2488, Seq. ID No. 2490, Seq. ID No. 2492, Seq. ID No. 2510, Seq. ID No.  
10 2520, Seq. ID No. 2526, Seq. ID No. 2548, Seq. ID No. 2554, Seq. ID No. 2564,  
Seq. ID No. 2588, Seq. ID No. 2600, Seq. ID No. 2608, Seq. ID No. 2614, Seq.  
ID No. 2652, Seq. ID No. 2676, Seq. ID No. 2682, Seq. ID No. 2688, Seq. ID No.  
2694, Seq. ID No. 2700, Seq. ID No. 2704, Seq. ID No. 2710, Seq. ID No. 2712,  
Seq. ID No. 2728, Seq. ID No. 2754, Seq. ID No. 2820, Seq. ID No. 2822, Seq.  
15 ID No. 2824, Seq. ID No. 2868, Seq. ID No. 2872, Seq. ID No. 2908, Seq. ID No.  
2920, Seq. ID No. 2958, Seq. ID No. 2972, Seq. ID No. 2980, Seq. ID No. 3000,  
Seq. ID No. 3006, Seq. ID No. 3020, Seq. ID No. 3036, Seq. ID No. 3066, Seq.  
ID No. 3086, Seq. ID No. 3150, Seq. ID No. 3166, Seq. ID No. 3184, Seq. ID No.  
3204, Seq. ID No. 3212, Seq. ID No. 3252, Seq. ID No. 3260, Seq. ID No. 3320,  
20 Seq. ID No. 3324, Seq. ID No. 3336, Seq. ID No. 3338, Seq. ID No. 3348, Seq.  
ID No. 3360, Seq. ID No. 3378, Seq. ID No. 3380, Seq. ID No. 3400, Seq. ID No.  
3426, Seq. ID No. 3484, Seq. ID No. 3496, Seq. ID No. 3498, Seq. ID No. 3520,  
Seq. ID No. 3530, Seq. ID No. 3600, Seq. ID No. 3612, Seq. ID No. 3616, Seq.  
ID No. 3620, Seq. ID No. 3664, Seq. ID No. 3740, Seq. ID No. 3760, Seq. ID No.  
25 3772, Seq. ID No. 3798, Seq. ID No. 3826, Seq. ID No. 3842, Seq. ID No. 3856,  
Seq. ID No. 3864, Seq. ID No. 3902, Seq. ID No. 3930, Seq. ID No. 4016, Seq.  
ID No. 4018, Seq. ID No. 4056, Seq. ID No. 4076, Seq. ID No. 4086, Seq. ID No.  
4090, Seq. ID No. 4100, Seq. ID No. 4106, Seq. ID No. 4130, Seq. ID No. 4204,  
Seq. ID No. 4244, Seq. ID No. 4252, Seq. ID No. 4344, Seq. ID No. 4384, Seq.  
30 ID No. 4476, Seq. ID No. 4482, Seq. ID No. 4488, Seq. ID No. 4492, Seq. ID No.  
4534, Seq. ID No. 4628, Seq. ID No. 4706, Seq. ID No. 4714, Seq. ID No. 4718,  
Seq. ID No. 4720, Seq. ID No. 4730, Seq. ID No. 4790, Seq. ID No. 4792, Seq.  
ID No. 4794, Seq. ID No. 4804, Seq. ID No. 4814, Seq. ID No. 4816, Seq. ID No.

4826, Seq. ID No. 4834, Seq. ID No. 4838, Seq. ID No. 4876, Seq. ID No. 4880, Seq. ID No. 4920, Seq. ID No. 4932, Seq. ID No. 4948, Seq. ID No. 4986, Seq. ID No. 5078, Seq. ID No. 5116, Seq. ID No. 5118, Seq. ID No. 5128, Seq. ID No. 5142, Seq. ID No. 5194, Seq. ID No. 5216, Seq. ID No. 5220, Seq. ID No. 5276, Seq. ID No. 5382, Seq. ID No. 5390, Seq. ID No. 5410, Seq. ID No. 5412, Seq. ID No. 5476, Seq. ID No. 5492, Seq. ID No. 5514, Seq. ID No. 5520, Seq. ID No. 5526, Seq. ID No. 5530, Seq. ID No. 5538, Seq. ID No. 5558, Seq. ID No. 5582, Seq. ID No. 5600, Seq. ID No. 5638, Seq. ID No. 5686, Seq. ID No. 5724, Seq. ID No. 5756, Seq. ID No. 5762, Seq. ID No. 5896, Seq. ID No. 5902, Seq. ID No. 5904, Seq. ID No. 5912, Seq. ID No. 5914, Seq. ID No. 5920, Seq. ID No. 5924, Seq. ID No. 5930, Seq. ID No. 6002, Seq. ID No. 6044, Seq. ID No. 6054, Seq. ID No. 6056, Seq. ID No. 6090, Seq. ID No. 6096, Seq. ID No. 6112, Seq. ID No. 6118, Seq. ID No. 6166, Seq. ID No. 6170, Seq. ID No. 6188, Seq. ID No. 6196, Seq. ID No. 6220, Seq. ID No. 6234, Seq. ID No. 6270, Seq. ID No. 6276, Seq. ID No. 6280, Seq. ID No. 6288, Seq. ID No. 6298, Seq. ID No. 6300, Seq. ID No. 6306, Seq. ID No. 6312, Seq. ID No. 6370, Seq. ID No. 6380, Seq. ID No. 6588, and Seq. ID No. 6592.

43. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is identified using proteomics methodology as sharing homology with surface exposed proteins of *Streptococcus pneumoniae*, and is selected from one of Seq. ID No. 2, Seq. ID No. 6, Seq. ID No. 94, Seq. ID No. 96, Seq. ID No. 104, Seq. ID No. 108, Seq. ID No. 158, Seq. ID No. 224, Seq. ID No. 226, Seq. ID No. 234, Seq. ID No. 240, Seq. ID No. 254, Seq. ID No. 318, Seq. ID No. 322, Seq. ID No. 342, Seq. ID No. 346, Seq. ID No. 354, Seq. ID No. 362, Seq. ID No. 364, Seq. ID No. 366, Seq. ID No. 376, Seq. ID No. 380, Seq. ID No. 384, Seq. ID No. 390, Seq. ID No. 392, Seq. ID No. 398, Seq. ID No. 406, Seq. ID No. 410, Seq. ID No. 416, Seq. ID No. 424, Seq. ID No. 426, Seq. ID No. 428, Seq. ID No. 430, Seq. ID No. 436, Seq. ID No. 438, Seq. ID No. 440, Seq. ID No. 442, Seq. ID No. 444, Seq. ID No. 446, Seq. ID No. 448, Seq. ID No. 450, Seq. ID No. 462, Seq. ID No. 464, Seq. ID No. 466, Seq. ID No. 514, Seq. ID No. 544, Seq. ID No. 552, Seq. ID No. 554, Seq. ID No. 560, Seq. ID No. 596, Seq. ID No. 602, Seq. ID No. 638, Seq. ID No. 650, Seq. ID No. 658, Seq. ID No. 670, Seq. ID No. 676, Seq. ID No. 684, Seq. ID No. 754, Seq. ID No. 930, Seq. ID No. 970, Seq. ID No. 1042, Seq.

5 ID No. 1044, Seq. ID No. 1086, Seq. ID No. 1090, Seq. ID No. 1094, Seq. ID No.  
1098, Seq. ID No. 1100, Seq. ID No. 1102, Seq. ID No. 1176, Seq. ID No. 1206,  
Seq. ID No. 1238, Seq. ID No. 1460, Seq. ID No. 1496, Seq. ID No. 1498, Seq.  
ID No. 1504, Seq. ID No. 1518, Seq. ID No. 1528, Seq. ID No. 1532, Seq. ID No.  
1540, Seq. ID No. 1544, Seq. ID No. 1550, Seq. ID No. 1574, Seq. ID No. 1658,  
Seq. ID No. 1710, Seq. ID No. 1768, Seq. ID No. 1786, Seq. ID No. 1822, Seq.  
ID No. 1890, Seq. ID No. 1926, Seq. ID No. 1970, Seq. ID No. 2004, Seq. ID No.  
2048, Seq. ID No. 2076, Seq. ID No. 2090, Seq. ID No. 2094, Seq. ID No. 2118,  
Seq. ID No. 2138, Seq. ID No. 2144, Seq. ID No. 2206, Seq. ID No. 2236, Seq.  
10 ID No. 2258, Seq. ID No. 2302, Seq. ID No. 2364, Seq. ID No. 2424, Seq. ID No.  
2446, Seq. ID No. 2452, Seq. ID No. 2482, Seq. ID No. 2496, Seq. ID No. 2506,  
Seq. ID No. 2578, Seq. ID No. 2588, Seq. ID No. 2614, Seq. ID No. 2634, Seq.  
ID No. 2652, Seq. ID No. 2666, Seq. ID No. 2670, Seq. ID No. 2678, Seq. ID No.  
2688, Seq. ID No. 2694, Seq. ID No. 2700, Seq. ID No. 2712, Seq. ID No. 2716,  
15 Seq. ID No. 2758, Seq. ID No. 2792, Seq. ID No. 2794, Seq. ID No. 2804, Seq.  
ID No. 2868, Seq. ID No. 2920, Seq. ID No. 2930, Seq. ID No. 3006, Seq. ID No.  
3020, Seq. ID No. 3126, Seq. ID No. 3138, Seq. ID No. 3162, Seq. ID No. 3180,  
Seq. ID No. 3252, Seq. ID No. 3260, Seq. ID No. 3286, Seq. ID No. 3310, Seq.  
ID No. 3318, Seq. ID No. 3338, Seq. ID No. 3346, Seq. ID No. 3360, Seq. ID No.  
20 3476, Seq. ID No. 3516, Seq. ID No. 3522, Seq. ID No. 3642, Seq. ID No. 3696,  
Seq. ID No. 3794, Seq. ID No. 3902, Seq. ID No. 3928, Seq. ID No. 3988, Seq.  
ID No. 4002, Seq. ID No. 4058, Seq. ID No. 4082, Seq. ID No. 4112, Seq. ID No.  
4126, Seq. ID No. 4194, Seq. ID No. 4196, Seq. ID No. 4238, Seq. ID No. 4248,  
Seq. ID No. 4384, Seq. ID No. 4394, Seq. ID No. 4398, Seq. ID No. 4402, Seq.  
25 ID No. 4436, Seq. ID No. 4450, Seq. ID No. 4472, Seq. ID No. 4492, Seq. ID No.  
4512, Seq. ID No. 4520, Seq. ID No. 4532, Seq. ID No. 4550, Seq. ID No. 4578,  
Seq. ID No. 4582, Seq. ID No. 4586, Seq. ID No. 4610, Seq. ID No. 4612, Seq.  
ID No. 4614, Seq. ID No. 4676, Seq. ID No. 4686, Seq. ID No. 4720, Seq. ID No.  
4730, Seq. ID No. 4744, Seq. ID No. 4756, Seq. ID No. 4782, Seq. ID No. 4788,  
30 Seq. ID No. 4838, Seq. ID No. 4842, Seq. ID No. 4850, Seq. ID No. 4856, Seq.  
ID No. 4890, Seq. ID No. 4902, Seq. ID No. 4916, Seq. ID No. 4918, Seq. ID No.  
4932, Seq. ID No. 4936, Seq. ID No. 4978, Seq. ID No. 5026, Seq. ID No. 5030,  
Seq. ID No. 5110, Seq. ID No. 5116, Seq. ID No. 5118, Seq. ID No. 5156, Seq.

ID No. 5186, Seq. ID No. 5202, Seq. ID No. 5204, Seq. ID No. 5220, Seq. ID No. 5262, Seq. ID No. 5290, Seq. ID No. 5296, Seq. ID No. 5378, Seq. ID No. 5390, Seq. ID No. 5400, Seq. ID No. 5412, Seq. ID No. 5538, Seq. ID No. 5622, Seq. ID No. 5628, Seq. ID No. 5658, Seq. ID No. 5676, Seq. ID No. 5718, Seq. ID No. 5778, Seq. ID No. 5860, Seq. ID No. 5902, Seq. ID No. 5914, Seq. ID No. 5920, Seq. ID No. 5926, Seq. ID No. 5934, Seq. ID No. 6056, Seq. ID No. 6130, Seq. ID No. 6134, Seq. ID No. 6188, Seq. ID No. 6194, Seq. ID No. 6220, Seq. ID No. 6272, Seq. ID No. 6278, Seq. ID No. 6370, Seq. ID No. 6376, Seq. ID No. 6380, Seq. ID No. 6390, Seq. ID No. 6592, and Seq. ID No. 6606.

44. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is identified as an *Alloiococcus otitidis* lipoprotein, and is selected from one Seq. ID No. 46, Seq. ID No. 48, Seq. ID No. 172, Seq. ID No. 226, Seq. ID No. 420, Seq. ID No. 514, Seq. ID No. 576, Seq. ID No. 592, Seq. ID No. 594, Seq. ID No. 658, Seq. ID No. 660, Seq. ID No. 670, Seq. ID No. 676, Seq. ID No. 746, Seq. ID No. 748, Seq. ID No. 936, Seq. ID No. 1046, Seq. ID No. 1076, Seq. ID No. 1138, Seq. ID No. 1174, Seq. ID No. 1192, Seq. ID No. 1194, Seq. ID No. 1196, Seq. ID No. 1564, Seq. ID No. 1662, Seq. ID No. 1664, Seq. ID No. 1666, Seq. ID No. 1792, Seq. ID No. 1798, Seq. ID No. 1918, Seq. ID No. 1970, Seq. ID No. 2116, Seq. ID No. 2160, Seq. ID No. 2430, Seq. ID No. 2528, Seq. ID No. 2700, Seq. ID No. 2816, Seq. ID No. 2876, Seq. ID No. 2976, Seq. ID No. 2978, Seq. ID No. 2992, Seq. ID No. 3044, Seq. ID No. 3324, Seq. ID No. 3338, Seq. ID No. 4134, Seq. ID No. 4138, Seq. ID No. 4482, Seq. ID No. 4706, Seq. ID No. 4828, Seq. ID No. 4870, Seq. ID No. 5116, Seq. ID No. 5378, Seq. ID No. 5380, Seq. ID No. 5492, Seq. ID No. 5510, Seq. ID No. 5514, Seq. ID No. 5526, Seq. ID No. 5530, Seq. ID No. 5532, Seq. ID No. 5890, Seq. ID No. 5910, Seq. ID No. 6026, Seq. ID No. 6028, Seq. ID No. 6088, Seq. ID No. 6090, Seq. ID No. 6326, Seq. ID No. 6328, Seq. ID No. 6416, Seq. ID No. 6638, Seq. ID No. 6640, and Seq. ID No. 6646.

45. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is identified as having a LPXTG motif and is covalently attached to the peptidoglycan layer, and is selected from one of Seq. ID No. 504, Seq. ID No.

506, Seq. ID No. 1316, Seq. ID No. 1318, Seq. ID No. 1364, Seq. ID No. 1366, Seq. ID No. 1368, Seq. ID No. 1370, Seq. ID No. 1560, Seq. ID No. 1562, Seq. ID No. 1582, Seq. ID No. 1740, Seq. ID No. 1742, Seq. ID No. 2812, Seq. ID No. 2814, Seq. ID No. 3620, Seq. ID No. 5588, Seq. ID No. 5590, Seq. ID No. 5592, Seq. ID No. 5782, Seq. ID No. 5784, and Seq. ID No. 6104.

46. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is identified as an *Alloiococcus otitidis* polypeptide, which is non-covalently associated with the peptidoglycan layer, and is selected from one of Seq. ID No. 3590, Seq. ID No. 3988, Seq. ID No. 5220, and Seq. ID No. 5338.
47. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is identified as an *Alloiococcus otitidis* polypeptide having an RGD<sub>X</sub> motif wherein X is not a proline residue and is selected from one of Seq. ID No. 38, Seq. ID No. 100, Seq. ID No. 108, Seq. ID No. 110, Seq. ID No. 112, Seq. ID No. 352, Seq. ID No. 354, Seq. ID No. 466, Seq. ID No. 468, Seq. ID No. 470, Seq. ID No. 472, Seq. ID No. 684, Seq. ID No. 822, Seq. ID No. 824, Seq. ID No. 1022, Seq. ID No. 1024, Seq. ID No. 1158, Seq. ID No. 1160, Seq. ID No. 1234, Seq. ID No. 1334, Seq. ID No. 1336, Seq. ID No. 1450, Seq. ID No. 1560, Seq. ID No. 1562, Seq. ID No. 1564, Seq. ID No. 1626, Seq. ID No. 1778, Seq. ID No. 1828, Seq. ID No. 1830, Seq. ID No. 1872, Seq. ID No. 1926, Seq. ID No. 2136, Seq. ID No. 2146, Seq. ID No. 2174, Seq. ID No. 2176, Seq. ID No. 2178, Seq. ID No. 2180, Seq. ID No. 2260, Seq. ID No. 2318, Seq. ID No. 2320, Seq. ID No. 2322, Seq. ID No. 2324, Seq. ID No. 2326, Seq. ID No. 2328, Seq. ID No. 2330, Seq. ID No. 2402, Seq. ID No. 2672, Seq. ID No. 2864, Seq. ID No. 2870, Seq. ID No. 2920, Seq. ID No. 2922, Seq. ID No. 2994, Seq. ID No. 3088, Seq. ID No. 3138, Seq. ID No. 3280, Seq. ID No. 3282, Seq. ID No. 3284, Seq. ID No. 3334, Seq. ID No. 3336, Seq. ID No. 3498, Seq. ID No. 3500, Seq. ID No. 3502, Seq. ID No. 3534, Seq. ID No. 3672, Seq. ID No. 3674, Seq. ID No. 3676, Seq. ID No. 3838, Seq. ID No. 3840, Seq. ID No. 3842, Seq. ID No. 3844, Seq. ID No. 3930, Seq. ID No. 3962, Seq. ID No. 4038, Seq. ID No. 4194, Seq. ID No. 4240, Seq. ID No. 4328, Seq. ID No. 4330, Seq. ID No. 4334, Seq. ID No. 4394, Seq. ID No. 4464, Seq. ID No. 4466, Seq. ID No. 4468, Seq. ID No. 4598, Seq. ID No. 4630, Seq. ID No.

4632, Seq. ID No. 4676, Seq. ID No. 4678, Seq. ID No. 4680, Seq. ID No. 4690,  
 Seq. ID No. 4692, Seq. ID No. 4694, Seq. ID No. 4782, Seq. ID No. 4800, Seq.  
 ID No. 4802, Seq. ID No. 4804, Seq. ID No. 4862, Seq. ID No. 5010, Seq. ID No.  
 5144, Seq. ID No. 5146, Seq. ID No. 5180, Seq. ID No. 5182, Seq. ID No. 5184,  
 5 Seq. ID No. 5250, Seq. ID No. 5252, Seq. ID No. 5254, Seq. ID No. 5260, Seq.  
 ID No. 5262, Seq. ID No. 5294, Seq. ID No. 5296, Seq. ID No. 5298, Seq. ID No.  
 5300, Seq. ID No. 5308, Seq. ID No. 5310, Seq. ID No. 5412, Seq. ID No. 5536,  
 Seq. ID No. 5538, Seq. ID No. 5746, Seq. ID No. 5822, Seq. ID No. 5824, Seq.  
 ID No. 5826, Seq. ID No. 6030, Seq. ID No. 6172, Seq. ID No. 6308, Seq. ID No.  
 10 6310, and Seq. ID No. 6312.

48. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is  
 predicted by BlastP as being involved in capsule biosynthesis and transport, and  
 is selected from one of Seq. ID No. 50, Seq. ID No. 52, Seq. ID No. 54, Seq. ID  
 15 No. 60, Seq. ID No. 196, Seq. ID No. 690, Seq. ID No. 704, Seq. ID No. 926,  
 Seq. ID No. 1598, Seq. ID No. 1602, Seq. ID No. 1608, Seq. ID No. 1612, Seq.  
 ID No. 1614, Seq. ID No. 1714, Seq. ID No. 2030, Seq. ID No. 2264, Seq. ID No.  
 2270, Seq. ID No. 2374, Seq. ID No. 2438, Seq. ID No. 2652, Seq. ID No. 2768,  
 Seq. ID No. 2908, Seq. ID No. 3398, Seq. ID No. 3400, Seq. ID No. 3480, Seq.  
 20 ID No. 3488, Seq. ID No. 3492, Seq. ID No. 3494, Seq. ID No. 3496, Seq. ID No.  
 3498, Seq. ID No. 3520, Seq. ID No. 3522, Seq. ID No. 3530, Seq. ID No. 3536,  
 Seq. ID No. 3562, Seq. ID No. 3884, Seq. ID No. 3892, Seq. ID No. 3982, and  
 Seq. ID No. 4088.

49. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polynucleotide  
 encoding the polypeptide is predicted by BlastP as being localized in the capsule  
 loci region of *Alloiococcus otitidis*, and is selected from one of Seq. ID No. 46,  
 Seq. ID No. 48, Seq. ID No. 52, Seq. ID No. 54, Seq. ID No. 56, Seq. ID No. 58,  
 Seq. ID No. 60, Seq. ID No. 684, Seq. ID No. 686, Seq. ID No. 688, Seq. ID No.  
 25 690, Seq. ID No. 692, Seq. ID No. 694, Seq. ID No. 696, Seq. ID No. 698, Seq.  
 ID No. 700, Seq. ID No. 702, Seq. ID No. 704, Seq. ID No. 706, Seq. ID No. 708,  
 Seq. ID No. 710, Seq. ID No. 712, Seq. ID No. 714, Seq. ID No. 716, Seq. ID No.  
 30 718, Seq. ID No. 720, Seq. ID No. 722, Seq. ID No. 724, Seq. ID No. 726, Seq.

5 ID No. 728, Seq. ID No. 730, Seq. ID No. 732, Seq. ID No. 734, Seq. ID No. 736,  
Seq. ID No. 738, Seq. ID No. 740, Seq. ID No. 742, Seq. ID No. 744, Seq. ID No.  
746, Seq. ID No. 748, Seq. ID No. 750, Seq. ID No. 752, Seq. ID No. 754, Seq.  
10 ID No. 3390, Seq. ID No. 3392, Seq. ID No. 3394, Seq. ID No. 3396, Seq. ID No.  
3398, Seq. ID No. 3400, Seq. ID No. 3402, Seq. ID No. 3404, Seq. ID No. 3406,  
Seq. ID No. 3408, Seq. ID No. 3410, Seq. ID No. 3412, Seq. ID No. 3414, Seq.  
ID No. 3416, Seq. ID No. 3418, Seq. ID No. 3420, Seq. ID No. 3422, Seq. ID No.  
3424, Seq. ID No. 3426, Seq. ID No. 3428, Seq. ID No. 3430, Seq. ID No. 3432,  
Seq. ID No. 3434, Seq. ID No. 3436, Seq. ID No. 3438, Seq. ID No. 3440, Seq.  
15 ID No. 3442, Seq. ID No. 3444, Seq. ID No. 3446, Seq. ID No. 3448, Seq. ID No.  
3450, Seq. ID No. 3452, Seq. ID No. 3454, Seq. ID No. 3456, Seq. ID No. 3458,  
Seq. ID No. 3460, Seq. ID No. 3462, Seq. ID No. 3464, Seq. ID No. 3466, Seq.  
ID No. 3468, Seq. ID No. 3470, Seq. ID No. 3472, Seq. ID No. 3474, Seq. ID No.  
3476, Seq. ID No. 3478, Seq. ID No. 3480, Seq. ID No. 3482, Seq. ID No. 3484,  
20 Seq. ID No. 3486, Seq. ID No. 3488, Seq. ID No. 3490, Seq. ID No. 3492, Seq.  
ID No. 3494, Seq. ID No. 3496, Seq. ID No. 3498, Seq. ID No. 3500, Seq. ID No.  
3502, Seq. ID No. 3504, Seq. ID No. 3506, Seq. ID No. 3508, Seq. ID No. 3510,  
Seq. ID No. 3512, Seq. ID No. 3514, Seq. ID No. 3516, Seq. ID No. 3518, Seq.  
ID No. 3520, Seq. ID No. 3522, Seq. ID No. 3524, Seq. ID No. 3526, Seq. ID No.  
25 3528, Seq. ID No. 3530, Seq. ID No. 3532, Seq. ID No. 3534, Seq. ID No. 3536,  
Seq. ID No. 3538, Seq. ID No. 3540, Seq. ID No. 3542, Seq. ID No. 3544, Seq.  
ID No. 3546, Seq. ID No. 3548, Seq. ID No. 3550, Seq. ID No. 3552, Seq. ID No.  
3554, Seq. ID No. 3556, Seq. ID No. 3558, Seq. ID No. 3560, and Seq. ID No.  
3562.

25 50. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is  
predicted by BlastP to be associated with sporulation, and is selected from one of  
Seq. ID No. 1138, Seq. ID No. 1456, Seq. ID No. 2138, Seq. ID No. 2142, Seq.  
ID No. 2166, Seq. ID No. 2180, Seq. ID No. 2302, Seq. ID No. 2754, Seq. ID No.  
30 4212, Seq. ID No. 4252, Seq. ID No. 4328, Seq. ID No. 4570, Seq. ID No. 4720,  
and Seq. ID No. 4730.

51. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide encoded by the polynucleotide is predicted by BlastP to be a unique polypeptide, and is selected from one of Seq. ID No. 8, Seq. ID No. 20, Seq. ID No. 22, Seq. ID No. 24, Seq. ID No. 32, Seq. ID No. 40, Seq. ID No. 66, Seq. ID No. 68, Seq. ID No. 70, Seq. ID No. 92, Seq. ID No. 100, Seq. ID No. 106, Seq. ID No. 114, Seq. ID No. 116, Seq. ID No. 124, Seq. ID No. 126, Seq. ID No. 128, Seq. ID No. 132, Seq. ID No. 134, Seq. ID No. 140, Seq. ID No. 152, Seq. ID No. 160, Seq. ID No. 162, Seq. ID No. 164, Seq. ID No. 166, Seq. ID No. 170, Seq. ID No. 186, Seq. ID No. 190, Seq. ID No. 194, Seq. ID No. 230, Seq. ID No. 232, Seq. ID No. 256, Seq. ID No. 258, Seq. ID No. 260, Seq. ID No. 276, Seq. ID No. 338, Seq. ID No. 340, Seq. ID No. 348, Seq. ID No. 350, Seq. ID No. 358, Seq. ID No. 360, Seq. ID No. 370, Seq. ID No. 372, Seq. ID No. 378, Seq. ID No. 386, Seq. ID No. 388, Seq. ID No. 394, Seq. ID No. 400, Seq. ID No. 402, Seq. ID No. 404, Seq. ID No. 408, Seq. ID No. 420, Seq. ID No. 432, Seq. ID No. 478, Seq. ID No. 496, Seq. ID No. 508, Seq. ID No. 520, Seq. ID No. 542, Seq. ID No. 546, Seq. ID No. 548, Seq. ID No. 550, Seq. ID No. 558, Seq. ID No. 590, Seq. ID No. 618, Seq. ID No. 620, Seq. ID No. 634, Seq. ID No. 640, Seq. ID No. 642, Seq. ID No. 644, Seq. ID No. 646, Seq. ID No. 648, Seq. ID No. 652, Seq. ID No. 654, Seq. ID No. 656, Seq. ID No. 668, Seq. ID No. 692, Seq. ID No. 694, Seq. ID No. 696, Seq. ID No. 698, Seq. ID No. 716, Seq. ID No. 718, Seq. ID No. 720, Seq. ID No. 732, Seq. ID No. 734, Seq. ID No. 742, Seq. ID No. 744, Seq. ID No. 746, Seq. ID No. 748, Seq. ID No. 750, Seq. ID No. 752, Seq. ID No. 756, Seq. ID No. 758, Seq. ID No. 760, Seq. ID No. 762, Seq. ID No. 764, Seq. ID No. 766, Seq. ID No. 768, Seq. ID No. 802, Seq. ID No. 804, Seq. ID No. 806, Seq. ID No. 808, Seq. ID No. 810, Seq. ID No. 812, Seq. ID No. 814, Seq. ID No. 834, Seq. ID No. 842, Seq. ID No. 850, Seq. ID No. 852, Seq. ID No. 854, Seq. ID No. 856, Seq. ID No. 888, Seq. ID No. 890, Seq. ID No. 892, Seq. ID No. 904, Seq. ID No. 906, Seq. ID No. 910, Seq. ID No. 938, Seq. ID No. 942, Seq. ID No. 944, Seq. ID No. 952, Seq. ID No. 958, Seq. ID No. 974, Seq. ID No. 976, Seq. ID No. 988, Seq. ID No. 1006, Seq. ID No. 1008, Seq. ID No. 1010, Seq. ID No. 1012, Seq. ID No. 1020, Seq. ID No. 1026, Seq. ID No. 1028, Seq. ID No. 1046, Seq. ID No. 1048, Seq. ID No. 1072, Seq. ID No. 1074, Seq. ID No. 1078, Seq. ID No. 1106, Seq. ID No. 1108, Seq. ID No. 1112, Seq. ID No. 1132, Seq. ID No. 1136, Seq. ID No. 1140,



Seq. ID No. 1152, Seq. ID No. 1154, Seq. ID No. 1166, Seq. ID No. 1168, Seq.  
ID No. 1170, Seq. ID No. 1172, Seq. ID No. 1174, Seq. ID No. 1182, Seq. ID No.  
1184, Seq. ID No. 1186, Seq. ID No. 1188, Seq. ID No. 1190, Seq. ID No. 1192,  
Seq. ID No. 1194, Seq. ID No. 1196, Seq. ID No. 1198, Seq. ID No. 1200, Seq.  
5 ID No. 1202, Seq. ID No. 1204, Seq. ID No. 1208, Seq. ID No. 1214, Seq. ID No.  
1228, Seq. ID No. 1230, Seq. ID No. 1240, Seq. ID No. 1244, Seq. ID No. 1246,  
Seq. ID No. 1248, Seq. ID No. 1250, Seq. ID No. 1260, Seq. ID No. 1266, Seq.  
ID No. 1268, Seq. ID No. 1270, Seq. ID No. 1272, Seq. ID No. 1274, Seq. ID No.  
1276, Seq. ID No. 1278, Seq. ID No. 1280, Seq. ID No. 1282, Seq. ID No. 1284,  
10 Seq. ID No. 1286, Seq. ID No. 1288, Seq. ID No. 1290, Seq. ID No. 1292, Seq.  
ID No. 1294, Seq. ID No. 1296, Seq. ID No. 1298, Seq. ID No. 1300, Seq. ID No.  
1302, Seq. ID No. 1304, Seq. ID No. 1306, Seq. ID No. 1308, Seq. ID No. 1310,  
Seq. ID No. 1312, Seq. ID No. 1314, Seq. ID No. 1320, Seq. ID No. 1322, Seq.  
ID No. 1324, Seq. ID No. 1326, Seq. ID No. 1328, Seq. ID No. 1338, Seq. ID No.  
15 1342, Seq. ID No. 1344, Seq. ID No. 1348, Seq. ID No. 1350, Seq. ID No. 1352,  
Seq. ID No. 1354, Seq. ID No. 1356, Seq. ID No. 1372, Seq. ID No. 1380, Seq.  
ID No. 1382, Seq. ID No. 1390, Seq. ID No. 1398, Seq. ID No. 1400, Seq. ID No.  
1402, Seq. ID No. 1418, Seq. ID No. 1420, Seq. ID No. 1422, Seq. ID No. 1424,  
Seq. ID No. 1440, Seq. ID No. 1446, Seq. ID No. 1448, Seq. ID No. 1458, Seq.  
20 ID No. 1466, Seq. ID No. 1480, Seq. ID No. 1512, Seq. ID No. 1552, Seq. ID No.  
1554, Seq. ID No. 1556, Seq. ID No. 1558, Seq. ID No. 1580, Seq. ID No. 1610,  
Seq. ID No. 1622, Seq. ID No. 1624, Seq. ID No. 1626, Seq. ID No. 1628, Seq.  
ID No. 1630, Seq. ID No. 1632, Seq. ID No. 1634, Seq. ID No. 1640, Seq. ID No.  
1644, Seq. ID No. 1656, Seq. ID No. 1668, Seq. ID No. 1672, Seq. ID No. 1694,  
25 Seq. ID No. 1696, Seq. ID No. 1702, Seq. ID No. 1704, Seq. ID No. 1706, Seq.  
ID No. 1722, Seq. ID No. 1724, Seq. ID No. 1732, Seq. ID No. 1738, Seq. ID No.  
1744, Seq. ID No. 1760, Seq. ID No. 1764, Seq. ID No. 1774, Seq. ID No. 1776,  
Seq. ID No. 1778, Seq. ID No. 1780, Seq. ID No. 1782, Seq. ID No. 1800, Seq.  
ID No. 1802, Seq. ID No. 1804, Seq. ID No. 1808, Seq. ID No. 1824, Seq. ID No.  
30 1832, Seq. ID No. 1852, Seq. ID No. 1858, Seq. ID No. 1876, Seq. ID No. 1900,  
Seq. ID No. 1916, Seq. ID No. 1928, Seq. ID No. 1930, Seq. ID No. 1974, Seq.  
ID No. 1978, Seq. ID No. 1982, Seq. ID No. 2006, Seq. ID No. 2008, Seq. ID No.  
2010, Seq. ID No. 2012, Seq. ID No. 2018, Seq. ID No. 2020, Seq. ID No. 2024,

Seq. ID No. 2026, Seq. ID No. 2028, Seq. ID No. 2040, Seq. ID No. 2042, Seq.  
ID No. 2044, Seq. ID No. 2046, Seq. ID No. 2050, Seq. ID No. 2082, Seq. ID No.  
2084, Seq. ID No. 2086, Seq. ID No. 2106, Seq. ID No. 2108, Seq. ID No. 2110,  
Seq. ID No. 2112, Seq. ID No. 2130, Seq. ID No. 2132, Seq. ID No. 2134, Seq.  
5 ID No. 2146, Seq. ID No. 2156, Seq. ID No. 2158, Seq. ID No. 2160, Seq. ID No.  
2162, Seq. ID No. 2172, Seq. ID No. 2188, Seq. ID No. 2190, Seq. ID No. 2202,  
Seq. ID No. 2204, Seq. ID No. 2210, Seq. ID No. 2212, Seq. ID No. 2220, Seq.  
ID No. 2226, Seq. ID No. 2244, Seq. ID No. 2246, Seq. ID No. 2248, Seq. ID No.  
2250, Seq. ID No. 2252, Seq. ID No. 2256, Seq. ID No. 2278, Seq. ID No. 2280,  
10 Seq. ID No. 2342, Seq. ID No. 2352, Seq. ID No. 2354, Seq. ID No. 2356, Seq.  
ID No. 2358, Seq. ID No. 2360, Seq. ID No. 2366, Seq. ID No. 2368, Seq. ID No.  
2372, Seq. ID No. 2376, Seq. ID No. 2394, Seq. ID No. 2396, Seq. ID No. 2426,  
Seq. ID No. 2428, Seq. ID No. 2432, Seq. ID No. 2440, Seq. ID No. 2442, Seq.  
ID No. 2444, Seq. ID No. 2448, Seq. ID No. 2460, Seq. ID No. 2480, Seq. ID No.  
15 2494, Seq. ID No. 2502, Seq. ID No. 2504, Seq. ID No. 2522, Seq. ID No. 2524,  
Seq. ID No. 2528, Seq. ID No. 2592, Seq. ID No. 2602, Seq. ID No. 2604, Seq.  
ID No. 2612, Seq. ID No. 2628, Seq. ID No. 2630, Seq. ID No. 2654, Seq. ID No.  
2662, Seq. ID No. 2692, Seq. ID No. 2696, Seq. ID No. 2698, Seq. ID No. 2718,  
Seq. ID No. 2730, Seq. ID No. 2732, Seq. ID No. 2734, Seq. ID No. 2736, Seq.  
20 ID No. 2740, Seq. ID No. 2742, Seq. ID No. 2744, Seq. ID No. 2778, Seq. ID No.  
2780, Seq. ID No. 2782, Seq. ID No. 2784, Seq. ID No. 2802, Seq. ID No. 2806,  
Seq. ID No. 2808, Seq. ID No. 2810, Seq. ID No. 2812, Seq. ID No. 2814, Seq.  
ID No. 2816, Seq. ID No. 2818, Seq. ID No. 2820, Seq. ID No. 2830, Seq. ID No.  
2832, Seq. ID No. 2834, Seq. ID No. 2836, Seq. ID No. 2838, Seq. ID No. 2840,  
25 Seq. ID No. 2842, Seq. ID No. 2846, Seq. ID No. 2850, Seq. ID No. 2852, Seq.  
ID No. 2854, Seq. ID No. 2856, Seq. ID No. 2858, Seq. ID No. 2860, Seq. ID No.  
2862, Seq. ID No. 2866, Seq. ID No. 2874, Seq. ID No. 2876, Seq. ID No. 2878,  
Seq. ID No. 2884, Seq. ID No. 2886, Seq. ID No. 2888, Seq. ID No. 2890, Seq.  
ID No. 2894, Seq. ID No. 2896, Seq. ID No. 2904, Seq. ID No. 2910, Seq. ID No.  
30 2936, Seq. ID No. 2938, Seq. ID No. 2940, Seq. ID No. 2942, Seq. ID No. 2944,  
Seq. ID No. 2946, Seq. ID No. 2948, Seq. ID No. 2950, Seq. ID No. 2952, Seq.  
ID No. 2954, Seq. ID No. 2966, Seq. ID No. 2968, Seq. ID No. 2974, Seq. ID No.  
2976, Seq. ID No. 2978, Seq. ID No. 2982, Seq. ID No. 2984, Seq. ID No. 2986,

Seq. ID No. 2988, Seq. ID No. 2990, Seq. ID No. 2992, Seq. ID No. 3002, Seq.  
ID No. 3008, Seq. ID No. 3010, Seq. ID No. 3012, Seq. ID No. 3022, Seq. ID No.  
3024, Seq. ID No. 3042, Seq. ID No. 3046, Seq. ID No. 3072, Seq. ID No. 3088,  
Seq. ID No. 3106, Seq. ID No. 3108, Seq. ID No. 3120, Seq. ID No. 3122, Seq.  
5 ID No. 3124, Seq. ID No. 3152, Seq. ID No. 3154, Seq. ID No. 3168, Seq. ID No.  
3174, Seq. ID No. 3176, Seq. ID No. 3178, Seq. ID No. 3182, Seq. ID No. 3194,  
Seq. ID No. 3214, Seq. ID No. 3216, Seq. ID No. 3218, Seq. ID No. 3220, Seq.  
ID No. 3222, Seq. ID No. 3224, Seq. ID No. 3232, Seq. ID No. 3234, Seq. ID No.  
3236, Seq. ID No. 3238, Seq. ID No. 3240, Seq. ID No. 3242, Seq. ID No. 3244,  
10 Seq. ID No. 3246, Seq. ID No. 3248, Seq. ID No. 3250, Seq. ID No. 3262, Seq.  
ID No. 3264, Seq. ID No. 3266, Seq. ID No. 3268, Seq. ID No. 3270, Seq. ID No.  
3272, Seq. ID No. 3274, Seq. ID No. 3276, Seq. ID No. 3278, Seq. ID No. 3326,  
Seq. ID No. 3332, Seq. ID No. 3340, Seq. ID No. 3342, Seq. ID No. 3350, Seq.  
ID No. 3362, Seq. ID No. 3364, Seq. ID No. 3370, Seq. ID No. 3372, Seq. ID No.  
15 3390, Seq. ID No. 3404, Seq. ID No. 3418, Seq. ID No. 3420, Seq. ID No. 3422,  
Seq. ID No. 3434, Seq. ID No. 3438, Seq. ID No. 3442, Seq. ID No. 3444, Seq.  
ID No. 3446, Seq. ID No. 3448, Seq. ID No. 3474, Seq. ID No. 3482, Seq. ID No.  
3484, Seq. ID No. 3490, Seq. ID No. 3504, Seq. ID No. 3506, Seq. ID No. 3510,  
Seq. ID No. 3512, Seq. ID No. 3524, Seq. ID No. 3526, Seq. ID No. 3532, Seq.  
20 ID No. 3534, Seq. ID No. 3540, Seq. ID No. 3542, Seq. ID No. 3544, Seq. ID No.  
3546, Seq. ID No. 3548, Seq. ID No. 3556, Seq. ID No. 3558, Seq. ID No. 3564,  
Seq. ID No. 3566, Seq. ID No. 3572, Seq. ID No. 3574, Seq. ID No. 3582, Seq.  
ID No. 3588, Seq. ID No. 3592, Seq. ID No. 3594, Seq. ID No. 3596, Seq. ID No.  
3612, Seq. ID No. 3614, Seq. ID No. 3618, Seq. ID No. 3620, Seq. ID No. 3622,  
25 Seq. ID No. 3624, Seq. ID No. 3626, Seq. ID No. 3632, Seq. ID No. 3638, Seq.  
ID No. 3640, Seq. ID No. 3656, Seq. ID No. 3658, Seq. ID No. 3660, Seq. ID No.  
3662, Seq. ID No. 3678, Seq. ID No. 3680, Seq. ID No. 3684, Seq. ID No. 3686,  
Seq. ID No. 3702, Seq. ID No. 3704, Seq. ID No. 3718, Seq. ID No. 3720, Seq.  
ID No. 3722, Seq. ID No. 3724, Seq. ID No. 3730, Seq. ID No. 3732, Seq. ID No.  
30 3734, Seq. ID No. 3736, Seq. ID No. 3738, Seq. ID No. 3740, Seq. ID No. 3742,  
Seq. ID No. 3750, Seq. ID No. 3752, Seq. ID No. 3754, Seq. ID No. 3756, Seq.  
ID No. 3762, Seq. ID No. 3782, Seq. ID No. 3784, Seq. ID No. 3786, Seq. ID No.  
3788, Seq. ID No. 3790, Seq. ID No. 3792, Seq. ID No. 3800, Seq. ID No. 3808,

Seq. ID No. 3810, Seq. ID No. 3812, Seq. ID No. 3814, Seq. ID No. 3816, Seq.  
ID No. 3818, Seq. ID No. 3828, Seq. ID No. 3830, Seq. ID No. 3832, Seq. ID No.  
3834, Seq. ID No. 3836, Seq. ID No. 3850, Seq. ID No. 3880, Seq. ID No. 3882,  
Seq. ID No. 3896, Seq. ID No. 3904, Seq. ID No. 3910, Seq. ID No. 3916, Seq.  
5 ID No. 3940, Seq. ID No. 3960, Seq. ID No. 3962, Seq. ID No. 3964, Seq. ID No.  
3966, Seq. ID No. 3974, Seq. ID No. 3978, Seq. ID No. 3980, Seq. ID No. 3994,  
Seq. ID No. 3996, Seq. ID No. 3998, Seq. ID No. 4006, Seq. ID No. 4008, Seq.  
ID No. 4010, Seq. ID No. 4042, Seq. ID No. 4044, Seq. ID No. 4046, Seq. ID No.  
4070, Seq. ID No. 4078, Seq. ID No. 4098, Seq. ID No. 4114, Seq. ID No. 4124,  
10 Seq. ID No. 4132, Seq. ID No. 4134, Seq. ID No. 4136, Seq. ID No. 4140, Seq.  
ID No. 4152, Seq. ID No. 4154, Seq. ID No. 4156, Seq. ID No. 4182, Seq. ID No.  
4222, Seq. ID No. 4242, Seq. ID No. 4254, Seq. ID No. 4258, Seq. ID No. 4260,  
Seq. ID No. 4262, Seq. ID No. 4264, Seq. ID No. 4266, Seq. ID No. 4270, Seq.  
ID No. 4276, Seq. ID No. 4278, Seq. ID No. 4280, Seq. ID No. 4282, Seq. ID No.  
15 4286, Seq. ID No. 4288, Seq. ID No. 4298, Seq. ID No. 4306, Seq. ID No. 4308,  
Seq. ID No. 4364, Seq. ID No. 4366, Seq. ID No. 4372, Seq. ID No. 4374, Seq.  
ID No. 4396, Seq. ID No. 4400, Seq. ID No. 4404, Seq. ID No. 4426, Seq. ID No.  
4438, Seq. ID No. 4440, Seq. ID No. 4442, Seq. ID No. 4454, Seq. ID No. 4456,  
Seq. ID No. 4514, Seq. ID No. 4516, Seq. ID No. 4552, Seq. ID No. 4562, Seq.  
20 ID No. 4574, Seq. ID No. 4576, Seq. ID No. 4588, Seq. ID No. 4590, Seq. ID No.  
4592, Seq. ID No. 4594, Seq. ID No. 4596, Seq. ID No. 4618, Seq. ID No. 4620,  
Seq. ID No. 4622, Seq. ID No. 4626, Seq. ID No. 4628, Seq. ID No. 4634, Seq.  
ID No. 4636, Seq. ID No. 4638, Seq. ID No. 4640, Seq. ID No. 4660, Seq. ID No.  
4682, Seq. ID No. 4688, Seq. ID No. 4696, Seq. ID No. 4700, Seq. ID No. 4702,  
25 Seq. ID No. 4722, Seq. ID No. 4736, Seq. ID No. 4738, Seq. ID No. 4742, Seq.  
ID No. 4784, Seq. ID No. 4790, Seq. ID No. 4806, Seq. ID No. 4812, Seq. ID No.  
4818, Seq. ID No. 4820, Seq. ID No. 4822, Seq. ID No. 4824, Seq. ID No. 4836,  
Seq. ID No. 4854, Seq. ID No. 4886, Seq. ID No. 4914, Seq. ID No. 4924, Seq.  
ID No. 4950, Seq. ID No. 4952, Seq. ID No. 4976, Seq. ID No. 4982, Seq. ID No.  
30 4984, Seq. ID No. 4988, Seq. ID No. 4994, Seq. ID No. 5000, Seq. ID No. 5002,  
Seq. ID No. 5012, Seq. ID No. 5014, Seq. ID No. 5024, Seq. ID No. 5032, Seq.  
ID No. 5034, Seq. ID No. 5036, Seq. ID No. 5038, Seq. ID No. 5042, Seq. ID No.  
5044, Seq. ID No. 5054, Seq. ID No. 5062, Seq. ID No. 5064, Seq. ID No. 5086,

Seq. ID No. 5094, Seq. ID No. 5152, Seq. ID No. 5154, Seq. ID No. 5160, Seq.  
ID No. 5162, Seq. ID No. 5168, Seq. ID No. 5174, Seq. ID No. 5176, Seq. ID No.  
5178, Seq. ID No. 5190, Seq. ID No. 5192, Seq. ID No. 5194, Seq. ID No. 5198,  
Seq. ID No. 5200, Seq. ID No. 5222, Seq. ID No. 5224, Seq. ID No. 5226, Seq.  
5 ID No. 5228, Seq. ID No. 5238, Seq. ID No. 5268, Seq. ID No. 5270, Seq. ID No.  
5272, Seq. ID No. 5282, Seq. ID No. 5302, Seq. ID No. 5304, Seq. ID No. 5316,  
Seq. ID No. 5322, Seq. ID No. 5328, Seq. ID No. 5348, Seq. ID No. 5386, Seq.  
ID No. 5446, Seq. ID No. 5448, Seq. ID No. 5460, Seq. ID No. 5466, Seq. ID No.  
5468, Seq. ID No. 5480, Seq. ID No. 5482, Seq. ID No. 5486, Seq. ID No. 5488,  
10 Seq. ID No. 5516, Seq. ID No. 5518, Seq. ID No. 5534, Seq. ID No. 5544, Seq.  
ID No. 5546, Seq. ID No. 5550, Seq. ID No. 5570, Seq. ID No. 5578, Seq. ID No.  
5594, Seq. ID No. 5596, Seq. ID No. 5610, Seq. ID No. 5624, Seq. ID No. 5626,  
Seq. ID No. 5640, Seq. ID No. 5642, Seq. ID No. 5644, Seq. ID No. 5650, Seq.  
ID No. 5660, Seq. ID No. 5662, Seq. ID No. 5664, Seq. ID No. 5668, Seq. ID No.  
15 5672, Seq. ID No. 5688, Seq. ID No. 5690, Seq. ID No. 5704, Seq. ID No. 5706,  
Seq. ID No. 5710, Seq. ID No. 5712, Seq. ID No. 5738, Seq. ID No. 5740, Seq.  
ID No. 5746, Seq. ID No. 5752, Seq. ID No. 5764, Seq. ID No. 5798, Seq. ID No.  
5812, Seq. ID No. 5814, Seq. ID No. 5816, Seq. ID No. 5828, Seq. ID No. 5830,  
Seq. ID No. 5844, Seq. ID No. 5846, Seq. ID No. 5874, Seq. ID No. 5880, Seq.  
20 ID No. 5884, Seq. ID No. 5886, Seq. ID No. 5888, Seq. ID No. 5890, Seq. ID No.  
5892, Seq. ID No. 5932, Seq. ID No. 5956, Seq. ID No. 5964, Seq. ID No. 5966,  
Seq. ID No. 5976, Seq. ID No. 5984, Seq. ID No. 5986, Seq. ID No. 5988, Seq.  
ID No. 5990, Seq. ID No. 6006, Seq. ID No. 6014, Seq. ID No. 6032, Seq. ID No.  
6036, Seq. ID No. 6046, Seq. ID No. 6060, Seq. ID No. 6062, Seq. ID No. 6064,  
25 Seq. ID No. 6074, Seq. ID No. 6082, Seq. ID No. 6092, Seq. ID No. 6094, Seq.  
ID No. 6128, Seq. ID No. 6160, Seq. ID No. 6198, Seq. ID No. 6200, Seq. ID No.  
6204, Seq. ID No. 6218, Seq. ID No. 6222, Seq. ID No. 6224, Seq. ID No. 6238,  
Seq. ID No. 6240, Seq. ID No. 6242, Seq. ID No. 6246, Seq. ID No. 6248, Seq.  
ID No. 6250, Seq. ID No. 6260, Seq. ID No. 6266, Seq. ID No. 6268, Seq. ID No.  
30 6274, Seq. ID No. 6284, Seq. ID No. 6286, Seq. ID No. 6324, Seq. ID No. 6326,  
Seq. ID No. 6328, Seq. ID No. 6362, Seq. ID No. 6364, Seq. ID No. 6378, Seq.  
ID No. 6382, Seq. ID No. 6402, Seq. ID No. 6404, Seq. ID No. 6420, Seq. ID No.  
6426, Seq. ID No. 6428, Seq. ID No. 6430, Seq. ID No. 6432, Seq. ID No. 6434,

Seq. ID No. 6436, Seq. ID No. 6438, Seq. ID No. 6440, Seq. ID No. 6448, Seq. ID No. 6450, Seq. ID No. 6452, Seq. ID No. 6454, Seq. ID No. 6456, Seq. ID No. 6458, Seq. ID No. 6466, Seq. ID No. 6468, Seq. ID No. 6470, Seq. ID No. 6472, Seq. ID No. 6474, Seq. ID No. 6476, Seq. ID No. 6478, Seq. ID No. 6480, Seq. ID No. 6482, Seq. ID No. 6484, Seq. ID No. 6486, Seq. ID No. 6488, Seq. ID No. 6490, Seq. ID No. 6492, Seq. ID No. 6496, Seq. ID No. 6498, Seq. ID No. 6508, Seq. ID No. 6518, Seq. ID No. 6520, Seq. ID No. 6522, Seq. ID No. 6524, Seq. ID No. 6526, Seq. ID No. 6528, Seq. ID No. 6530, Seq. ID No. 6534, Seq. ID No. 6540, Seq. ID No. 6542, Seq. ID No. 6544, Seq. ID No. 6556, Seq. ID No. 6558, Seq. ID No. 6562, Seq. ID No. 6564, Seq. ID No. 6566, Seq. ID No. 6568, Seq. ID No. 6570, Seq. ID No. 6572, Seq. ID No. 6574, Seq. ID No. 6582, Seq. ID No. 6584, Seq. ID No. 6632, Seq. ID No. 6636, Seq. ID No. 6638, Seq. ID No. 6640, Seq. ID No. 6644, Seq. ID No. 6646, Seq. ID No. 6648, and Seq. ID No. 6650.

52. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is identified as an *Alloiococcus otitidis* polypeptide identified by Glimmer™ ORF finder program, and is selected from one of Seq. ID No. 2, Seq. ID No. 6, Seq. ID No. 12, Seq. ID No. 14, Seq. ID No. 16, Seq. ID No. 18, Seq. ID No. 26, Seq. ID No. 28, Seq. ID No. 30, Seq. ID No. 36, Seq. ID No. 38, Seq. ID No. 42, Seq. ID No. 44, Seq. ID No. 48, Seq. ID No. 52, Seq. ID No. 54, Seq. ID No. 60, Seq. ID No. 64, Seq. ID No. 70, Seq. ID No. 74, Seq. ID No. 76, Seq. ID No. 82, Seq. ID No. 84, Seq. ID No. 90, Seq. ID No. 94, Seq. ID No. 98, Seq. ID No. 104, Seq. ID No. 112, Seq. ID No. 122, Seq. ID No. 126, Seq. ID No. 130, Seq. ID No. 136, Seq. ID No. 138, Seq. ID No. 146, Seq. ID No. 150, Seq. ID No. 158, Seq. ID No. 168, Seq. ID No. 174, Seq. ID No. 184, Seq. ID No. 188, Seq. ID No. 190, Seq. ID No. 192, Seq. ID No. 196, Seq. ID No. 198, Seq. ID No. 204, Seq. ID No. 208, Seq. ID No. 216, Seq. ID No. 220, Seq. ID No. 224, Seq. ID No. 226, Seq. ID No. 228, Seq. ID No. 232, Seq. ID No. 234, Seq. ID No. 240, Seq. ID No. 242, Seq. ID No. 248, Seq. ID No. 254, Seq. ID No. 262, Seq. ID No. 266, Seq. ID No. 270, Seq. ID No. 274, Seq. ID No. 276, Seq. ID No. 278, Seq. ID No. 284, Seq. ID No. 292, Seq. ID No. 294, Seq. ID No. 298, Seq. ID No. 302, Seq. ID No. 308, Seq. ID No. 310, Seq. ID No. 314, Seq. ID No. 318, Seq. ID No. 322, Seq. ID No. 326, Seq. ID No. 336, Seq. ID No. 344, Seq. ID No. 346, Seq. ID No. 354, Seq. ID No.

356, Seq. ID No. 362, Seq. ID No. 364, Seq. ID No. 368, Seq. ID No. 376, Seq.  
ID No. 380, Seq. ID No. 384, Seq. ID No. 390, Seq. ID No. 392, Seq. ID No. 398,  
Seq. ID No. 406, Seq. ID No. 412, Seq. ID No. 416, Seq. ID No. 418, Seq. ID No.  
424, Seq. ID No. 426, Seq. ID No. 428, Seq. ID No. 430, Seq. ID No. 436, Seq.  
5 ID No. 438, Seq. ID No. 440, Seq. ID No. 442, Seq. ID No. 446, Seq. ID No. 448,  
Seq. ID No. 454, Seq. ID No. 462, Seq. ID No. 464, Seq. ID No. 472, Seq. ID No.  
486, Seq. ID No. 502, Seq. ID No. 506, Seq. ID No. 512, Seq. ID No. 516, Seq.  
ID No. 518, Seq. ID No. 522, Seq. ID No. 524, Seq. ID No. 532, Seq. ID No. 534,  
Seq. ID No. 540, Seq. ID No. 542, Seq. ID No. 544, Seq. ID No. 552, Seq. ID No.  
10 556, Seq. ID No. 562, Seq. ID No. 566, Seq. ID No. 570, Seq. ID No. 576, Seq.  
ID No. 580, Seq. ID No. 588, Seq. ID No. 594, Seq. ID No. 598, Seq. ID No. 604,  
Seq. ID No. 606, Seq. ID No. 610, Seq. ID No. 612, Seq. ID No. 614, Seq. ID No.  
616, Seq. ID No. 624, Seq. ID No. 628, Seq. ID No. 630, Seq. ID No. 632, Seq.  
ID No. 636, Seq. ID No. 638, Seq. ID No. 648, Seq. ID No. 650, Seq. ID No. 662,  
15 Seq. ID No. 670, Seq. ID No. 674, Seq. ID No. 676, Seq. ID No. 682, Seq. ID No.  
684, Seq. ID No. 690, Seq. ID No. 702, Seq. ID No. 704, Seq. ID No. 710, Seq.  
ID No. 714, Seq. ID No. 730, Seq. ID No. 734, Seq. ID No. 736, Seq. ID No. 738,  
Seq. ID No. 742, Seq. ID No. 748, Seq. ID No. 752, Seq. ID No. 754, Seq. ID No.  
760, Seq. ID No. 766, Seq. ID No. 768, Seq. ID No. 772, Seq. ID No. 782, Seq.  
20 ID No. 784, Seq. ID No. 788, Seq. ID No. 792, Seq. ID No. 796, Seq. ID No. 800,  
Seq. ID No. 808, Seq. ID No. 818, Seq. ID No. 820, Seq. ID No. 824, Seq. ID No.  
828, Seq. ID No. 832, Seq. ID No. 836, Seq. ID No. 838, Seq. ID No. 840, Seq.  
ID No. 848, Seq. ID No. 852, Seq. ID No. 856, Seq. ID No. 860, Seq. ID No. 868,  
Seq. ID No. 872, Seq. ID No. 876, Seq. ID No. 882, Seq. ID No. 886, Seq. ID No.  
25 890, Seq. ID No. 892, Seq. ID No. 896, Seq. ID No. 902, Seq. ID No. 908, Seq.  
ID No. 916, Seq. ID No. 920, Seq. ID No. 926, Seq. ID No. 930, Seq. ID No. 936,  
Seq. ID No. 940, Seq. ID No. 950, Seq. ID No. 952, Seq. ID No. 956, Seq. ID No.  
962, Seq. ID No. 966, Seq. ID No. 968, Seq. ID No. 972, Seq. ID No. 986, Seq.  
ID No. 994, Seq. ID No. 998, Seq. ID No. 1004, Seq. ID No. 1006, Seq. ID No.  
30 1010, Seq. ID No. 1018, Seq. ID No. 1024, Seq. ID No. 1040, Seq. ID No. 1042,  
Seq. ID No. 1044, Seq. ID No. 1052, Seq. ID No. 1054, Seq. ID No. 1058, Seq.  
ID No. 1062, Seq. ID No. 1066, Seq. ID No. 1068, Seq. ID No. 1070, Seq. ID No.  
1074, Seq. ID No. 1076, Seq. ID No. 1084, Seq. ID No. 1088, Seq. ID No. 1092,

Seq. ID No. 1094, Seq. ID No. 1098, Seq. ID No. 1100, Seq. ID No. 1104, Seq.  
ID No. 1110, Seq. ID No. 1116, Seq. ID No. 1118, Seq. ID No. 1124, Seq. ID No.  
1130, Seq. ID No. 1134, Seq. ID No. 1138, Seq. ID No. 1144, Seq. ID No. 1148,  
Seq. ID No. 1150, Seq. ID No. 1156, Seq. ID No. 1158, Seq. ID No. 1160, Seq.  
5 ID No. 1164, Seq. ID No. 1172, Seq. ID No. 1180, Seq. ID No. 1182, Seq. ID No.  
1188, Seq. ID No. 1194, Seq. ID No. 1200, Seq. ID No. 1206, Seq. ID No. 1212,  
Seq. ID No. 1218, Seq. ID No. 1222, Seq. ID No. 1224, Seq. ID No. 1226, Seq.  
ID No. 1232, Seq. ID No. 1234, Seq. ID No. 1238, Seq. ID No. 1242, Seq. ID No.  
1254, Seq. ID No. 1258, Seq. ID No. 1264, Seq. ID No. 1272, Seq. ID No. 1282,  
10 Seq. ID No. 1318, Seq. ID No. 1324, Seq. ID No. 1332, Seq. ID No. 1336, Seq.  
ID No. 1340, Seq. ID No. 1346, Seq. ID No. 1348, Seq. ID No. 1362, Seq. ID No.  
1370, Seq. ID No. 1378, Seq. ID No. 1380, Seq. ID No. 1388, Seq. ID No. 1394,  
Seq. ID No. 1396, Seq. ID No. 1400, Seq. ID No. 1404, Seq. ID No. 1406, Seq.  
ID No. 1412, Seq. ID No. 1414, Seq. ID No. 1416, Seq. ID No. 1420, Seq. ID No.  
15 1426, Seq. ID No. 1428, Seq. ID No. 1430, Seq. ID No. 1432, Seq. ID No. 1434,  
Seq. ID No. 1438, Seq. ID No. 1444, Seq. ID No. 1450, Seq. ID No. 1452, Seq.  
ID No. 1456, Seq. ID No. 1458, Seq. ID No. 1460, Seq. ID No. 1464, Seq. ID No.  
1466, Seq. ID No. 1470, Seq. ID No. 1472, Seq. ID No. 1474, Seq. ID No. 1476,  
Seq. ID No. 1478, Seq. ID No. 1486, Seq. ID No. 1488, Seq. ID No. 1492, Seq.  
20 ID No. 1494, Seq. ID No. 1496, Seq. ID No. 1498, Seq. ID No. 1502, Seq. ID No.  
1506, Seq. ID No. 1508, Seq. ID No. 1510, Seq. ID No. 1518, Seq. ID No. 1526,  
Seq. ID No. 1528, Seq. ID No. 1532, Seq. ID No. 1540, Seq. ID No. 1542, Seq.  
ID No. 1544, Seq. ID No. 1550, Seq. ID No. 1562, Seq. ID No. 1564, Seq. ID No.  
1568, Seq. ID No. 1572, Seq. ID No. 1574, Seq. ID No. 1578, Seq. ID No. 1582,  
25 Seq. ID No. 1590, Seq. ID No. 1594, Seq. ID No. 1596, Seq. ID No. 1598, Seq.  
ID No. 1604, Seq. ID No. 1608, Seq. ID No. 1612, Seq. ID No. 1614, Seq. ID No.  
1620, Seq. ID No. 1624, Seq. ID No. 1628, Seq. ID No. 1632, Seq. ID No. 1638,  
Seq. ID No. 1640, Seq. ID No. 1642, Seq. ID No. 1648, Seq. ID No. 1654, Seq.  
ID No. 1658, Seq. ID No. 1666, Seq. ID No. 1670, Seq. ID No. 1682, Seq. ID No.  
30 1686, Seq. ID No. 1690, Seq. ID No. 1692, Seq. ID No. 1698, Seq. ID No. 1700,  
Seq. ID No. 1708, Seq. ID No. 1712, Seq. ID No. 1714, Seq. ID No. 1720, Seq.  
ID No. 1724, Seq. ID No. 1730, Seq. ID No. 1736, Seq. ID No. 1738, Seq. ID No.  
1742, Seq. ID No. 1748, Seq. ID No. 1752, Seq. ID No. 1758, Seq. ID No. 1760,



Seq. ID No. 1762, Seq. ID No. 1772, Seq. ID No. 1778, Seq. ID No. 1786, Seq.  
ID No. 1790, Seq. ID No. 1792, Seq. ID No. 1798, Seq. ID No. 1802, Seq. ID No.  
1804, Seq. ID No. 1806, Seq. ID No. 1812, Seq. ID No. 1818, Seq. ID No. 1820,  
Seq. ID No. 1822, Seq. ID No. 1826, Seq. ID No. 1830, Seq. ID No. 1838, Seq.  
5 ID No. 1844, Seq. ID No. 1846, Seq. ID No. 1848, Seq. ID No. 1850, Seq. ID No.  
1852, Seq. ID No. 1856, Seq. ID No. 1860, Seq. ID No. 1864, Seq. ID No. 1866,  
Seq. ID No. 1868, Seq. ID No. 1872, Seq. ID No. 1874, Seq. ID No. 1878, Seq.  
ID No. 1886, Seq. ID No. 1888, Seq. ID No. 1890, Seq. ID No. 1896, Seq. ID No.  
1898, Seq. ID No. 1900, Seq. ID No. 1904, Seq. ID No. 1906, Seq. ID No. 1914,  
10 Seq. ID No. 1920, Seq. ID No. 1924, Seq. ID No. 1926, Seq. ID No. 1932, Seq.  
ID No. 1936, Seq. ID No. 1938, Seq. ID No. 1944, Seq. ID No. 1946, Seq. ID No.  
1950, Seq. ID No. 1954, Seq. ID No. 1958, Seq. ID No. 1960, Seq. ID No. 1962,  
Seq. ID No. 1966, Seq. ID No. 1968, Seq. ID No. 1972, Seq. ID No. 1976, Seq.  
ID No. 1980, Seq. ID No. 1984, Seq. ID No. 1988, Seq. ID No. 1990, Seq. ID No.  
15 1992, Seq. ID No. 2000, Seq. ID No. 2002, Seq. ID No. 2004, Seq. ID No. 2010,  
Seq. ID No. 2016, Seq. ID No. 2020, Seq. ID No. 2022, Seq. ID No. 2032, Seq.  
ID No. 2036, Seq. ID No. 2038, Seq. ID No. 2046, Seq. ID No. 2048, Seq. ID No.  
2056, Seq. ID No. 2060, Seq. ID No. 2066, Seq. ID No. 2068, Seq. ID No. 2070,  
Seq. ID No. 2072, Seq. ID No. 2074, Seq. ID No. 2080, Seq. ID No. 2092, Seq.  
20 ID No. 2094, Seq. ID No. 2098, Seq. ID No. 2100, Seq. ID No. 2104, Seq. ID No.  
2116, Seq. ID No. 2120, Seq. ID No. 2128, Seq. ID No. 2136, Seq. ID No. 2138,  
Seq. ID No. 2142, Seq. ID No. 2144, Seq. ID No. 2148, Seq. ID No. 2154, Seq.  
ID No. 2160, Seq. ID No. 2162, Seq. ID No. 2166, Seq. ID No. 2170, Seq. ID No.  
2180, Seq. ID No. 2184, Seq. ID No. 2186, Seq. ID No. 2190, Seq. ID No. 2192,  
25 Seq. ID No. 2194, Seq. ID No. 2196, Seq. ID No. 2200, Seq. ID No. 2208, Seq.  
ID No. 2218, Seq. ID No. 2220, Seq. ID No. 2222, Seq. ID No. 2224, Seq. ID No.  
2228, Seq. ID No. 2230, Seq. ID No. 2232, Seq. ID No. 2234, Seq. ID No. 2242,  
Seq. ID No. 2246, Seq. ID No. 2252, Seq. ID No. 2254, Seq. ID No. 2258, Seq.  
ID No. 2260, Seq. ID No. 2264, Seq. ID No. 2268, Seq. ID No. 2270, Seq. ID No.  
30 2276, Seq. ID No. 2282, Seq. ID No. 2288, Seq. ID No. 2298, Seq. ID No. 2300,  
Seq. ID No. 2302, Seq. ID No. 2316, Seq. ID No. 2330, Seq. ID No. 2334, Seq.  
ID No. 2336, Seq. ID No. 2340, Seq. ID No. 2344, Seq. ID No. 2346, Seq. ID No.  
2350, Seq. ID No. 2352, Seq. ID No. 2358, Seq. ID No. 2360, Seq. ID No. 2364,

Seq. ID No. 2366, Seq. ID No. 2370, Seq. ID No. 2374, Seq. ID No. 2382, Seq.  
ID No. 2392, Seq. ID No. 2400, Seq. ID No. 2402, Seq. ID No. 2406, Seq. ID No.  
2410, Seq. ID No. 2416, Seq. ID No. 2418, Seq. ID No. 2422, Seq. ID No. 2424,  
Seq. ID No. 2428, Seq. ID No. 2430, Seq. ID No. 2432, Seq. ID No. 2436, Seq.  
5 ID No. 2438, Seq. ID No. 2440, Seq. ID No. 2444, Seq. ID No. 2446, Seq. ID No.  
2450, Seq. ID No. 2452, Seq. ID No. 2454, Seq. ID No. 2458, Seq. ID No. 2464,  
Seq. ID No. 2466, Seq. ID No. 2470, Seq. ID No. 2472, Seq. ID No. 2476, Seq.  
ID No. 2478, Seq. ID No. 2484, Seq. ID No. 2486, Seq. ID No. 2492, Seq. ID No.  
2496, Seq. ID No. 2506, Seq. ID No. 2508, Seq. ID No. 2514, Seq. ID No. 2520,  
10 Seq. ID No. 2526, Seq. ID No. 2530, Seq. ID No. 2536, Seq. ID No. 2538, Seq.  
ID No. 2540, Seq. ID No. 2550, Seq. ID No. 2554, Seq. ID No. 2564, Seq. ID No.  
2568, Seq. ID No. 2576, Seq. ID No. 2578, Seq. ID No. 2582, Seq. ID No. 2590,  
Seq. ID No. 2594, Seq. ID No. 2596, Seq. ID No. 2600, Seq. ID No. 2604, Seq.  
ID No. 2608, Seq. ID No. 2610, Seq. ID No. 2614, Seq. ID No. 2618, Seq. ID No.  
15 2620, Seq. ID No. 2624, Seq. ID No. 2626, Seq. ID No. 2632, Seq. ID No. 2634,  
Seq. ID No. 2640, Seq. ID No. 2642, Seq. ID No. 2646, Seq. ID No. 2650, Seq.  
ID No. 2652, Seq. ID No. 2656, Seq. ID No. 2660, Seq. ID No. 2664, Seq. ID No.  
2668, Seq. ID No. 2670, Seq. ID No. 2672, Seq. ID No. 2678, Seq. ID No. 2688,  
Seq. ID No. 2690, Seq. ID No. 2694, Seq. ID No. 2700, Seq. ID No. 2704, Seq.  
20 ID No. 2710, Seq. ID No. 2712, Seq. ID No. 2716, Seq. ID No. 2720, Seq. ID No.  
2726, Seq. ID No. 2728, Seq. ID No. 2738, Seq. ID No. 2744, Seq. ID No. 2748,  
Seq. ID No. 2752, Seq. ID No. 2754, Seq. ID No. 2760, Seq. ID No. 2764, Seq.  
ID No. 2766, Seq. ID No. 2768, Seq. ID No. 2772, Seq. ID No. 2774, Seq. ID No.  
2776, Seq. ID No. 2782, Seq. ID No. 2788, Seq. ID No. 2790, Seq. ID No. 2792,  
25 Seq. ID No. 2794, Seq. ID No. 2798, Seq. ID No. 2800, Seq. ID No. 2804, Seq.  
ID No. 2806, Seq. ID No. 2812, Seq. ID No. 2816, Seq. ID No. 2824, Seq. ID No.  
2828, Seq. ID No. 2844, Seq. ID No. 2848, Seq. ID No. 2864, Seq. ID No. 2868,  
Seq. ID No. 2870, Seq. ID No. 2872, Seq. ID No. 2878, Seq. ID No. 2882, Seq.  
ID No. 2892, Seq. ID No. 2900, Seq. ID No. 2902, Seq. ID No. 2904, Seq. ID No.  
30 2908, Seq. ID No. 2912, Seq. ID No. 2914, Seq. ID No. 2918, Seq. ID No. 2920,  
Seq. ID No. 2922, Seq. ID No. 2924, Seq. ID No. 2928, Seq. ID No. 2934, Seq.  
ID No. 2946, Seq. ID No. 2954, Seq. ID No. 2958, Seq. ID No. 2964, Seq. ID No.  
2972, Seq. ID No. 2974, Seq. ID No. 2978, Seq. ID No. 2980, Seq. ID No. 2984,

Seq. ID No. 2986, Seq. ID No. 2992, Seq. ID No. 2994, Seq. ID No. 3000, Seq.  
ID No. 3002, Seq. ID No. 3006, Seq. ID No. 3012, Seq. ID No. 3020, Seq. ID No.  
3028, Seq. ID No. 3034, Seq. ID No. 3036, Seq. ID No. 3040, Seq. ID No. 3044,  
Seq. ID No. 3046, Seq. ID No. 3050, Seq. ID No. 3056, Seq. ID No. 3060, Seq.  
5 ID No. 3062, Seq. ID No. 3068, Seq. ID No. 3070, Seq. ID No. 3082, Seq. ID No.  
3090, Seq. ID No. 3092, Seq. ID No. 3094, Seq. ID No. 3098, Seq. ID No. 3104,  
Seq. ID No. 3108, Seq. ID No. 3112, Seq. ID No. 3118, Seq. ID No. 3126, Seq.  
ID No. 3134, Seq. ID No. 3136, Seq. ID No. 3138, Seq. ID No. 3142, Seq. ID No.  
3144, Seq. ID No. 3150, Seq. ID No. 3156, Seq. ID No. 3158, Seq. ID No. 3160,  
10 Seq. ID No. 3162, Seq. ID No. 3166, Seq. ID No. 3172, Seq. ID No. 3178, Seq.  
ID No. 3180, Seq. ID No. 3184, Seq. ID No. 3186, Seq. ID No. 3190, Seq. ID No.  
3192, Seq. ID No. 3198, Seq. ID No. 3204, Seq. ID No. 3206, Seq. ID No. 3212,  
Seq. ID No. 3218, Seq. ID No. 3222, Seq. ID No. 3228, Seq. ID No. 3230, Seq.  
ID No. 3234, Seq. ID No. 3236, Seq. ID No. 3240, Seq. ID No. 3250, Seq. ID No.  
15 3252, Seq. ID No. 3254, Seq. ID No. 3258, Seq. ID No. 3260, Seq. ID No. 3264,  
Seq. ID No. 3266, Seq. ID No. 3272, Seq. ID No. 3274, Seq. ID No. 3278, Seq.  
ID No. 3284, Seq. ID No. 3286, Seq. ID No. 3288, Seq. ID No. 3290, Seq. ID No.  
3294, Seq. ID No. 3296, Seq. ID No. 3300, Seq. ID No. 3304, Seq. ID No. 3308,  
Seq. ID No. 3314, Seq. ID No. 3316, Seq. ID No. 3320, Seq. ID No. 3324, Seq.  
20 ID No. 3330, Seq. ID No. 3336, Seq. ID No. 3338, Seq. ID No. 3348, Seq. ID No.  
3356, Seq. ID No. 3360, Seq. ID No. 3364, Seq. ID No. 3368, Seq. ID No. 3378,  
Seq. ID No. 3380, Seq. ID No. 3384, Seq. ID No. 3388, Seq. ID No. 3400, Seq.  
ID No. 3402, Seq. ID No. 3404, Seq. ID No. 3410, Seq. ID No. 3414, Seq. ID No.  
3416, Seq. ID No. 3418, Seq. ID No. 3426, Seq. ID No. 3428, Seq. ID No. 3432,  
25 Seq. ID No. 3436, Seq. ID No. 3438, Seq. ID No. 3440, Seq. ID No. 3448, Seq.  
ID No. 3460, Seq. ID No. 3462, Seq. ID No. 3468, Seq. ID No. 3470, Seq. ID No.  
3472, Seq. ID No. 3474, Seq. ID No. 3476, Seq. ID No. 3480, Seq. ID No. 3484,  
Seq. ID No. 3486, Seq. ID No. 3488, Seq. ID No. 3496, Seq. ID No. 3502, Seq.  
ID No. 3506, Seq. ID No. 3508, Seq. ID No. 3510, Seq. ID No. 3512, Seq. ID No.  
30 3520, Seq. ID No. 3522, Seq. ID No. 3526, Seq. ID No. 3530, Seq. ID No. 3534,  
Seq. ID No. 3538, Seq. ID No. 3544, Seq. ID No. 3550, Seq. ID No. 3554, Seq.  
ID No. 3562, Seq. ID No. 3566, Seq. ID No. 3570, Seq. ID No. 3576, Seq. ID No.  
3580, Seq. ID No. 3584, Seq. ID No. 3586, Seq. ID No. 3590, Seq. ID No. 3600,

Seq. ID No. 3606, Seq. ID No. 3608, Seq. ID No. 3610, Seq. ID No. 3612, Seq.  
ID No. 3616, Seq. ID No. 3620, Seq. ID No. 3630, Seq. ID No. 3636, Seq. ID No.  
3640, Seq. ID No. 3642, Seq. ID No. 3644, Seq. ID No. 3646, Seq. ID No. 3652,  
Seq. ID No. 3654, Seq. ID No. 3660, Seq. ID No. 3664, Seq. ID No. 3666, Seq.  
5 ID No. 3668, Seq. ID No. 3670, Seq. ID No. 3676, Seq. ID No. 3682, Seq. ID No.  
3690, Seq. ID No. 3696, Seq. ID No. 3700, Seq. ID No. 3710, Seq. ID No. 3716,  
Seq. ID No. 3722, Seq. ID No. 3728, Seq. ID No. 3730, Seq. ID No. 3734, Seq.  
ID No. 3736, Seq. ID No. 3740, Seq. ID No. 3742, Seq. ID No. 3748, Seq. ID No.  
3752, Seq. ID No. 3760, Seq. ID No. 3772, Seq. ID No. 3776, Seq. ID No. 3780,  
10 Seq. ID No. 3784, Seq. ID No. 3792, Seq. ID No. 3798, Seq. ID No. 3804, Seq.  
ID No. 3806, Seq. ID No. 3812, Seq. ID No. 3814, Seq. ID No. 3820, Seq. ID No.  
3824, Seq. ID No. 3826, Seq. ID No. 3834, Seq. ID No. 3836, Seq. ID No. 3844,  
Seq. ID No. 3848, Seq. ID No. 3856, Seq. ID No. 3858, Seq. ID No. 3864, Seq.  
ID No. 3868, Seq. ID No. 3874, Seq. ID No. 3878, Seq. ID No. 3882, Seq. ID No.  
15 3884, Seq. ID No. 3886, Seq. ID No. 3894, Seq. ID No. 3898, Seq. ID No. 3902,  
Seq. ID No. 3908, Seq. ID No. 3914, Seq. ID No. 3916, Seq. ID No. 3918, Seq.  
ID No. 3920, Seq. ID No. 3926, Seq. ID No. 3930, Seq. ID No. 3934, Seq. ID No.  
3936, Seq. ID No. 3938, Seq. ID No. 3942, Seq. ID No. 3944, Seq. ID No. 3946,  
Seq. ID No. 3950, Seq. ID No. 3952, Seq. ID No. 3956, Seq. ID No. 3958, Seq.  
20 ID No. 3972, Seq. ID No. 3976, Seq. ID No. 3984, Seq. ID No. 3986, Seq. ID No.  
3988, Seq. ID No. 3992, Seq. ID No. 4004, Seq. ID No. 4010, Seq. ID No. 4014,  
Seq. ID No. 4016, Seq. ID No. 4018, Seq. ID No. 4022, Seq. ID No. 4024, Seq.  
ID No. 4030, Seq. ID No. 4032, Seq. ID No. 4036, Seq. ID No. 4038, Seq. ID No.  
4040, Seq. ID No. 4050, Seq. ID No. 4056, Seq. ID No. 4058, Seq. ID No. 4062,  
25 Seq. ID No. 4064, Seq. ID No. 4068, Seq. ID No. 4070, Seq. ID No. 4076, Seq.  
ID No. 4078, Seq. ID No. 4080, Seq. ID No. 4088, Seq. ID No. 4090, Seq. ID No.  
4096, Seq. ID No. 4098, Seq. ID No. 4100, Seq. ID No. 4106, Seq. ID No. 4112,  
Seq. ID No. 4118, Seq. ID No. 4122, Seq. ID No. 4124, Seq. ID No. 4128, Seq.  
ID No. 4130, Seq. ID No. 4134, Seq. ID No. 4138, Seq. ID No. 4146, Seq. ID No.  
30 4150, Seq. ID No. 4158, Seq. ID No. 4162, Seq. ID No. 4164, Seq. ID No. 4168,  
Seq. ID No. 4174, Seq. ID No. 4180, Seq. ID No. 4186, Seq. ID No. 4192, Seq.  
ID No. 4194, Seq. ID No. 4196, Seq. ID No. 4198, Seq. ID No. 4200, Seq. ID No.  
4202, Seq. ID No. 4204, Seq. ID No. 4206, Seq. ID No. 4212, Seq. ID No. 4216,

Seq. ID No. 4218, Seq. ID No. 4220, Seq. ID No. 4236, Seq. ID No. 4238, Seq.  
ID No. 4240, Seq. ID No. 4244, Seq. ID No. 4252, Seq. ID No. 4256, Seq. ID No.  
4264, Seq. ID No. 4268, Seq. ID No. 4272, Seq. ID No. 4274, Seq. ID No. 4280,  
Seq. ID No. 4282, Seq. ID No. 4284, Seq. ID No. 4292, Seq. ID No. 4296, Seq.  
5 ID No. 4300, Seq. ID No. 4302, Seq. ID No. 4304, Seq. ID No. 4308, Seq. ID No.  
4310, Seq. ID No. 4314, Seq. ID No. 4318, Seq. ID No. 4324, Seq. ID No. 4326,  
Seq. ID No. 4330, Seq. ID No. 4332, Seq. ID No. 4334, Seq. ID No. 4340, Seq.  
ID No. 4344, Seq. ID No. 4348, Seq. ID No. 4354, Seq. ID No. 4356, Seq. ID No.  
4358, Seq. ID No. 4366, Seq. ID No. 4370, Seq. ID No. 4374, Seq. ID No. 4376,  
10 Seq. ID No. 4378, Seq. ID No. 4380, Seq. ID No. 4382, Seq. ID No. 4384, Seq.  
ID No. 4392, Seq. ID No. 4394, Seq. ID No. 4398, Seq. ID No. 4402, Seq. ID No.  
4412, Seq. ID No. 4418, Seq. ID No. 4424, Seq. ID No. 4432, Seq. ID No. 4434,  
Seq. ID No. 4436, Seq. ID No. 4444, Seq. ID No. 4448, Seq. ID No. 4452, Seq.  
ID No. 4460, Seq. ID No. 4462, Seq. ID No. 4468, Seq. ID No. 4472, Seq. ID No.  
15 4476, Seq. ID No. 4480, Seq. ID No. 4482, Seq. ID No. 4488, Seq. ID No. 4492,  
Seq. ID No. 4502, Seq. ID No. 4506, Seq. ID No. 4512, Seq. ID No. 4524, Seq.  
ID No. 4532, Seq. ID No. 4534, Seq. ID No. 4538, Seq. ID No. 4540, Seq. ID No.  
4542, Seq. ID No. 4544, Seq. ID No. 4548, Seq. ID No. 4550, Seq. ID No. 4560,  
Seq. ID No. 4566, Seq. ID No. 4568, Seq. ID No. 4572, Seq. ID No. 4576, Seq.  
20 ID No. 4578, Seq. ID No. 4582, Seq. ID No. 4586, Seq. ID No. 4592, Seq. ID No.  
4596, Seq. ID No. 4598, Seq. ID No. 4604, Seq. ID No. 4608, Seq. ID No. 4610,  
Seq. ID No. 4612, Seq. ID No. 4616, Seq. ID No. 4624, Seq. ID No. 4628, Seq.  
ID No. 4632, Seq. ID No. 4636, Seq. ID No. 4638, Seq. ID No. 4644, Seq. ID No.  
4650, Seq. ID No. 4652, Seq. ID No. 4654, Seq. ID No. 4658, Seq. ID No. 4662,  
25 Seq. ID No. 4664, Seq. ID No. 4670, Seq. ID No. 4672, Seq. ID No. 4674, Seq.  
ID No. 4680, Seq. ID No. 4686, Seq. ID No. 4694, Seq. ID No. 4698, Seq. ID No.  
4704, Seq. ID No. 4706, Seq. ID No. 4714, Seq. ID No. 4718, Seq. ID No. 4720,  
Seq. ID No. 4726, Seq. ID No. 4730, Seq. ID No. 4732, Seq. ID No. 4734, Seq.  
ID No. 4740, Seq. ID No. 4744, Seq. ID No. 4746, Seq. ID No. 4748, Seq. ID No.  
30 4750, Seq. ID No. 4752, Seq. ID No. 4758, Seq. ID No. 4766, Seq. ID No. 4770,  
Seq. ID No. 4778, Seq. ID No. 4780, Seq. ID No. 4782, Seq. ID No. 4788, Seq.  
ID No. 4790, Seq. ID No. 4792, Seq. ID No. 4798, Seq. ID No. 4804, Seq. ID No.  
4808, Seq. ID No. 4810, Seq. ID No. 4812, Seq. ID No. 4814, Seq. ID No. 4816,

Seq. ID No. 4822, Seq. ID No. 4824, Seq. ID No. 4826, Seq. ID No. 4828, Seq.  
ID No. 4834, Seq. ID No. 4836, Seq. ID No. 4838, Seq. ID No. 4844, Seq. ID No.  
4846, Seq. ID No. 4848, Seq. ID No. 4850, Seq. ID No. 4860, Seq. ID No. 4862,  
Seq. ID No. 4866, Seq. ID No. 4868, Seq. ID No. 4876, Seq. ID No. 4878, Seq.  
5 ID No. 4880, Seq. ID No. 4882, Seq. ID No. 4884, Seq. ID No. 4886, Seq. ID No.  
4888, Seq. ID No. 4894, Seq. ID No. 4900, Seq. ID No. 4902, Seq. ID No. 4904,  
Seq. ID No. 4906, Seq. ID No. 4908, Seq. ID No. 4912, Seq. ID No. 4916, Seq.  
ID No. 4918, Seq. ID No. 4920, Seq. ID No. 4922, Seq. ID No. 4928, Seq. ID No.  
4932, Seq. ID No. 4936, Seq. ID No. 4940, Seq. ID No. 4942, Seq. ID No. 4944,  
10 Seq. ID No. 4946, Seq. ID No. 4948, Seq. ID No. 4954, Seq. ID No. 4958, Seq.  
ID No. 4960, Seq. ID No. 4964, Seq. ID No. 4966, Seq. ID No. 4970, Seq. ID No.  
4972, Seq. ID No. 4974, Seq. ID No. 4980, Seq. ID No. 4986, Seq. ID No. 4990,  
Seq. ID No. 4992, Seq. ID No. 4996, Seq. ID No. 4998, Seq. ID No. 5002, Seq.  
ID No. 5008, Seq. ID No. 5010, Seq. ID No. 5018, Seq. ID No. 5022, Seq. ID No.  
15 5028, Seq. ID No. 5030, Seq. ID No. 5040, Seq. ID No. 5048, Seq. ID No. 5052,  
Seq. ID No. 5054, Seq. ID No. 5056, Seq. ID No. 5060, Seq. ID No. 5062, Seq.  
ID No. 5070, Seq. ID No. 5078, Seq. ID No. 5080, Seq. ID No. 5082, Seq. ID No.  
5084, Seq. ID No. 5088, Seq. ID No. 5092, Seq. ID No. 5094, Seq. ID No. 5098,  
Seq. ID No. 5104, Seq. ID No. 5106, Seq. ID No. 5110, Seq. ID No. 5112, Seq.  
20 ID No. 5114, Seq. ID No. 5116, Seq. ID No. 5118, Seq. ID No. 5128, Seq. ID No.  
5142, Seq. ID No. 5146, Seq. ID No. 5150, Seq. ID No. 5154, Seq. ID No. 5158,  
Seq. ID No. 5166, Seq. ID No. 5170, Seq. ID No. 5172, Seq. ID No. 5178, Seq.  
ID No. 5184, Seq. ID No. 5186, Seq. ID No. 5188, Seq. ID No. 5194, Seq. ID No.  
5196, Seq. ID No. 5202, Seq. ID No. 5204, Seq. ID No. 5206, Seq. ID No. 5210,  
25 Seq. ID No. 5212, Seq. ID No. 5216, Seq. ID No. 5220, Seq. ID No. 5228, Seq.  
ID No. 5232, Seq. ID No. 5236, Seq. ID No. 5238, Seq. ID No. 5240, Seq. ID No.  
5244, Seq. ID No. 5246, Seq. ID No. 5248, Seq. ID No. 5254, Seq. ID No. 5256,  
Seq. ID No. 5258, Seq. ID No. 5262, Seq. ID No. 5264, Seq. ID No. 5272, Seq.  
ID No. 5276, Seq. ID No. 5284, Seq. ID No. 5292, Seq. ID No. 5300, Seq. ID No.  
30 5306, Seq. ID No. 5310, Seq. ID No. 5312, Seq. ID No. 5314, Seq. ID No. 5320,  
Seq. ID No. 5324, Seq. ID No. 5326, Seq. ID No. 5336, Seq. ID No. 5338, Seq.  
ID No. 5342, Seq. ID No. 5346, Seq. ID No. 5352, Seq. ID No. 5356, Seq. ID No.  
5364, Seq. ID No. 5366, Seq. ID No. 5368, Seq. ID No. 5372, Seq. ID No. 5374,

Seq. ID No. 5382, Seq. ID No. 5384, Seq. ID No. 5388, Seq. ID No. 5390, Seq.  
ID No. 5392, Seq. ID No. 5394, Seq. ID No. 5396, Seq. ID No. 5398, Seq. ID No.  
5400, Seq. ID No. 5402, Seq. ID No. 5404, Seq. ID No. 5410, Seq. ID No. 5412,  
Seq. ID No. 5416, Seq. ID No. 5418, Seq. ID No. 5420, Seq. ID No. 5422, Seq.  
5 ID No. 5424, Seq. ID No. 5428, Seq. ID No. 5432, Seq. ID No. 5434, Seq. ID No.  
5440, Seq. ID No. 5442, Seq. ID No. 5444, Seq. ID No. 5448, Seq. ID No. 5450,  
Seq. ID No. 5452, Seq. ID No. 5454, Seq. ID No. 5456, Seq. ID No. 5458, Seq.  
ID No. 5474, Seq. ID No. 5478, Seq. ID No. 5484, Seq. ID No. 5488, Seq. ID No.  
5492, Seq. ID No. 5496, Seq. ID No. 5500, Seq. ID No. 5504, Seq. ID No. 5508,  
10 Seq. ID No. 5510, Seq. ID No. 5514, Seq. ID No. 5528, Seq. ID No. 5532, Seq.  
ID No. 5538, Seq. ID No. 5540, Seq. ID No. 5542, Seq. ID No. 5548, Seq. ID No.  
5554, Seq. ID No. 5558, Seq. ID No. 5560, Seq. ID No. 5564, Seq. ID No. 5568,  
Seq. ID No. 5572, Seq. ID No. 5576, Seq. ID No. 5582, Seq. ID No. 5586, Seq.  
ID No. 5592, Seq. ID No. 5600, Seq. ID No. 5602, Seq. ID No. 5606, Seq. ID No.  
15 5616, Seq. ID No. 5622, Seq. ID No. 5630, Seq. ID No. 5632, Seq. ID No. 5638,  
Seq. ID No. 5648, Seq. ID No. 5652, Seq. ID No. 5656, Seq. ID No. 5658, Seq.  
ID No. 5662, Seq. ID No. 5666, Seq. ID No. 5670, Seq. ID No. 5672, Seq. ID No.  
5674, Seq. ID No. 5680, Seq. ID No. 5686, Seq. ID No. 5694, Seq. ID No. 5698,  
Seq. ID No. 5700, Seq. ID No. 5702, Seq. ID No. 5708, Seq. ID No. 5716, Seq.  
20 ID No. 5718, Seq. ID No. 5724, Seq. ID No. 5728, Seq. ID No. 5736, Seq. ID No.  
5740, Seq. ID No. 5750, Seq. ID No. 5752, Seq. ID No. 5756, Seq. ID No. 5762,  
Seq. ID No. 5772, Seq. ID No. 5776, Seq. ID No. 5778, Seq. ID No. 5780, Seq.  
ID No. 5784, Seq. ID No. 5790, Seq. ID No. 5796, Seq. ID No. 5802, Seq. ID No.  
5804, Seq. ID No. 5810, Seq. ID No. 5816, Seq. ID No. 5820, Seq. ID No. 5826,  
25 Seq. ID No. 5834, Seq. ID No. 5836, Seq. ID No. 5842, Seq. ID No. 5846, Seq.  
ID No. 5848, Seq. ID No. 5850, Seq. ID No. 5852, Seq. ID No. 5854, Seq. ID No.  
5856, Seq. ID No. 5860, Seq. ID No. 5866, Seq. ID No. 5872, Seq. ID No. 5876,  
Seq. ID No. 5878, Seq. ID No. 5882, Seq. ID No. 5888, Seq. ID No. 5892, Seq.  
ID No. 5896, Seq. ID No. 5898, Seq. ID No. 5902, Seq. ID No. 5904, Seq. ID No.  
30 5912, Seq. ID No. 5914, Seq. ID No. 5916, Seq. ID No. 5918, Seq. ID No. 5920,  
Seq. ID No. 5930, Seq. ID No. 5932, Seq. ID No. 5934, Seq. ID No. 5938, Seq.  
ID No. 5942, Seq. ID No. 5944, Seq. ID No. 5948, Seq. ID No. 5952, Seq. ID No.  
5954, Seq. ID No. 5956, Seq. ID No. 5958, Seq. ID No. 5962, Seq. ID No. 5970,

Seq. ID No. 5974, Seq. ID No. 5980, Seq. ID No. 5982, Seq. ID No. 5986, Seq.  
ID No. 5990, Seq. ID No. 5994, Seq. ID No. 6002, Seq. ID No. 6004, Seq. ID No.  
6012, Seq. ID No. 6016, Seq. ID No. 6018, Seq. ID No. 6022, Seq. ID No. 6028,  
Seq. ID No. 6030, Seq. ID No. 6034, Seq. ID No. 6036, Seq. ID No. 6042, Seq.  
5 ID No. 6044, Seq. ID No. 6054, Seq. ID No. 6058, Seq. ID No. 6066, Seq. ID No.  
6072, Seq. ID No. 6080, Seq. ID No. 6086, Seq. ID No. 6090, Seq. ID No. 6096,  
Seq. ID No. 6098, Seq. ID No. 6102, Seq. ID No. 6104, Seq. ID No. 6112, Seq.  
ID No. 6114, Seq. ID No. 6118, Seq. ID No. 6124, Seq. ID No. 6126, Seq. ID No.  
6130, Seq. ID No. 6132, Seq. ID No. 6134, Seq. ID No. 6142, Seq. ID No. 6146,  
10 Seq. ID No. 6150, Seq. ID No. 6158, Seq. ID No. 6166, Seq. ID No. 6170, Seq.  
ID No. 6172, Seq. ID No. 6176, Seq. ID No. 6178, Seq. ID No. 6182, Seq. ID No.  
6188, Seq. ID No. 6196, Seq. ID No. 6202, Seq. ID No. 6210, Seq. ID No. 6214,  
Seq. ID No. 6216, Seq. ID No. 6220, Seq. ID No. 6234, Seq. ID No. 6236, Seq.  
ID No. 6244, Seq. ID No. 6250, Seq. ID No. 6252, Seq. ID No. 6258, Seq. ID No.  
15 6262, Seq. ID No. 6264, Seq. ID No. 6272, Seq. ID No. 6276, Seq. ID No. 6278,  
Seq. ID No. 6282, Seq. ID No. 6288, Seq. ID No. 6298, Seq. ID No. 6300, Seq.  
ID No. 6306, Seq. ID No. 6312, Seq. ID No. 6316, Seq. ID No. 6322, Seq. ID No.  
6324, Seq. ID No. 6328, Seq. ID No. 6332, Seq. ID No. 6334, Seq. ID No. 6338,  
Seq. ID No. 6340, Seq. ID No. 6342, Seq. ID No. 6344, Seq. ID No. 6346, Seq.  
20 ID No. 6354, Seq. ID No. 6358, Seq. ID No. 6360, Seq. ID No. 6362, Seq. ID No.  
6368, Seq. ID No. 6370, Seq. ID No. 6374, Seq. ID No. 6376, Seq. ID No. 6378,  
Seq. ID No. 6380, Seq. ID No. 6390, Seq. ID No. 6396, Seq. ID No. 6400, Seq.  
ID No. 6404, Seq. ID No. 6408, Seq. ID No. 6412, Seq. ID No. 6414, Seq. ID No.  
6418, Seq. ID No. 6424, Seq. ID No. 6434, Seq. ID No. 6438, Seq. ID No. 6440,  
25 Seq. ID No. 6446, Seq. ID No. 6450, Seq. ID No. 6452, Seq. ID No. 6458, Seq.  
ID No. 6460, Seq. ID No. 6462, Seq. ID No. 6464, Seq. ID No. 6478, Seq. ID No.  
6482, Seq. ID No. 6484, Seq. ID No. 6488, Seq. ID No. 6490, Seq. ID No. 6492,  
Seq. ID No. 6494, Seq. ID No. 6496, Seq. ID No. 6504, Seq. ID No. 6506, Seq.  
ID No. 6512, Seq. ID No. 6516, Seq. ID No. 6520, Seq. ID No. 6524, Seq. ID No.  
30 6526, Seq. ID No. 6530, Seq. ID No. 6532, Seq. ID No. 6534, Seq. ID No. 6538,  
Seq. ID No. 6546, Seq. ID No. 6552, Seq. ID No. 6554, Seq. ID No. 6560, Seq.  
ID No. 6564, Seq. ID No. 6568, Seq. ID No. 6578, Seq. ID No. 6580, Seq. ID No.  
6584, Seq. ID No. 6586, Seq. ID No. 6588, Seq. ID No. 6590, Seq. ID No. 6604,



Seq. ID No. 6606, Seq. ID No. 6610, Seq. ID No. 6614, Seq. ID No. 6616, Seq. ID No. 6618, Seq. ID No. 6622, Seq. ID No. 6624, Seq. ID No. 6628, Seq. ID No. 6630, Seq. ID No. 6634, and Seq. ID No. 6640.

- 5 53. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is identified as an *Alloiococcus otitidis* polypeptide by GeneMark™ ORF finder program, and is selected from one of Seq. ID No. 2, Seq. ID No. 4, Seq. ID No. 12, Seq. ID No. 14, Seq. ID No. 16, Seq. ID No. 18, Seq. ID No. 26, Seq. ID No. 28, Seq. ID No. 30, Seq. ID No. 36, Seq. ID No. 38, Seq. ID No. 40, Seq. ID No. 42, Seq. ID No. 44, Seq. ID No. 46, Seq. ID No. 50, Seq. ID No. 54, Seq. ID No. 58, Seq. ID No. 62, Seq. ID No. 70, Seq. ID No. 72, Seq. ID No. 76, Seq. ID No. 82, Seq. ID No. 84, Seq. ID No. 90, Seq. ID No. 96, Seq. ID No. 102, Seq. ID No. 112, Seq. ID No. 120, Seq. ID No. 126, Seq. ID No. 130, Seq. ID No. 136, Seq. ID No. 138, Seq. ID No. 142, Seq. ID No. 148, Seq. ID No. 152, Seq. ID No. 156, 15 Seq. ID No. 168, Seq. ID No. 172, Seq. ID No. 182, Seq. ID No. 186, Seq. ID No. 188, Seq. ID No. 190, Seq. ID No. 192, Seq. ID No. 196, Seq. ID No. 200, Seq. ID No. 208, Seq. ID No. 214, Seq. ID No. 220, Seq. ID No. 222, Seq. ID No. 226, Seq. ID No. 228, Seq. ID No. 230, Seq. ID No. 234, Seq. ID No. 240, Seq. ID No. 242, Seq. ID No. 244, Seq. ID No. 254, Seq. ID No. 262, Seq. ID No. 264, Seq. ID No. 268, Seq. ID No. 274, Seq. ID No. 276, Seq. ID No. 278, Seq. ID No. 280, Seq. ID No. 292, Seq. ID No. 294, Seq. ID No. 296, Seq. ID No. 300, Seq. ID No. 304, Seq. ID No. 310, Seq. ID No. 312, Seq. ID No. 316, Seq. ID No. 320, Seq. ID No. 324, Seq. ID No. 332, Seq. ID No. 342, Seq. ID No. 346, Seq. ID No. 352, Seq. ID No. 356, Seq. ID No. 362, Seq. ID No. 364, Seq. ID No. 366, Seq. ID No. 376, Seq. ID No. 380, Seq. ID No. 382, Seq. ID No. 384, Seq. ID No. 390, Seq. ID No. 392, Seq. ID No. 396, Seq. ID No. 400, Seq. ID No. 406, Seq. ID No. 410, Seq. ID No. 414, Seq. ID No. 418, Seq. ID No. 422, Seq. ID No. 424, Seq. ID No. 426, Seq. ID No. 428, Seq. ID No. 430, Seq. ID No. 436, Seq. ID No. 438, Seq. ID No. 440, Seq. ID No. 442, Seq. ID No. 444, Seq. ID No. 446, Seq. ID No. 448, 25 Seq. ID No. 450, Seq. ID No. 460, Seq. ID No. 466, Seq. ID No. 486, Seq. ID No. 502, Seq. ID No. 506, Seq. ID No. 512, Seq. ID No. 514, Seq. ID No. 518, Seq. ID No. 520, Seq. ID No. 524, Seq. ID No. 530, Seq. ID No. 534, Seq. ID No. 536, Seq. ID No. 542, Seq. ID No. 544, Seq. ID No. 552, Seq. ID No. 554, Seq. ID No. ...

560, Seq. ID No. 564, Seq. ID No. 570, Seq. ID No. 576, Seq. ID No. 580, Seq.  
ID No. 584, Seq. ID No. 592, Seq. ID No. 596, Seq. ID No. 602, Seq. ID No. 606,  
Seq. ID No. 608, Seq. ID No. 612, Seq. ID No. 614, Seq. ID No. 616, Seq. ID No.  
622, Seq. ID No. 628, Seq. ID No. 630, Seq. ID No. 634, Seq. ID No. 636, Seq.  
5 ID No. 638, Seq. ID No. 644, Seq. ID No. 650, Seq. ID No. 652, Seq. ID No. 656,  
Seq. ID No. 658, Seq. ID No. 670, Seq. ID No. 672, Seq. ID No. 676, Seq. ID No.  
682, Seq. ID No. 684, Seq. ID No. 686, Seq. ID No. 694, Seq. ID No. 704, Seq.  
ID No. 706, Seq. ID No. 712, Seq. ID No. 726, Seq. ID No. 732, Seq. ID No. 736,  
Seq. ID No. 738, Seq. ID No. 742, Seq. ID No. 744, Seq. ID No. 750, Seq. ID No.  
10 754, Seq. ID No. 760, Seq. ID No. 774, Seq. ID No. 782, Seq. ID No. 784, Seq.  
ID No. 786, Seq. ID No. 790, Seq. ID No. 794, Seq. ID No. 798, Seq. ID No. 804,  
Seq. ID No. 816, Seq. ID No. 820, Seq. ID No. 822, Seq. ID No. 828, Seq. ID No.  
832, Seq. ID No. 834, Seq. ID No. 836, Seq. ID No. 838, Seq. ID No. 842, Seq.  
ID No. 844, Seq. ID No. 850, Seq. ID No. 852, Seq. ID No. 854, Seq. ID No. 858,  
15 Seq. ID No. 866, Seq. ID No. 870, Seq. ID No. 874, Seq. ID No. 878, Seq. ID No.  
884, Seq. ID No. 888, Seq. ID No. 892, Seq. ID No. 896, Seq. ID No. 902, Seq.  
ID No. 908, Seq. ID No. 912, Seq. ID No. 918, Seq. ID No. 922, Seq. ID No. 928,  
Seq. ID No. 936, Seq. ID No. 940, Seq. ID No. 946, Seq. ID No. 952, Seq. ID No.  
954, Seq. ID No. 960, Seq. ID No. 964, Seq. ID No. 968, Seq. ID No. 970, Seq.  
20 ID No. 978, Seq. ID No. 990, Seq. ID No. 996, Seq. ID No. 1000, Seq. ID No.  
1006, Seq. ID No. 1008, Seq. ID No. 1016, Seq. ID No. 1022, Seq. ID No. 1036,  
Seq. ID No. 1042, Seq. ID No. 1044, Seq. ID No. 1050, Seq. ID No. 1054, Seq.  
ID No. 1058, Seq. ID No. 1060, Seq. ID No. 1064, Seq. ID No. 1068, Seq. ID No.  
1070, Seq. ID No. 1072, Seq. ID No. 1076, Seq. ID No. 1084, Seq. ID No. 1086,  
25 Seq. ID No. 1090, Seq. ID No. 1094, Seq. ID No. 1098, Seq. ID No. 1100, Seq.  
ID No. 1102, Seq. ID No. 1110, Seq. ID No. 1114, Seq. ID No. 1118, Seq. ID No.  
1122, Seq. ID No. 1130, Seq. ID No. 1134, Seq. ID No. 1138, Seq. ID No. 1142,  
Seq. ID No. 1146, Seq. ID No. 1150, Seq. ID No. 1156, Seq. ID No. 1158, Seq.  
ID No. 1160, Seq. ID No. 1164, Seq. ID No. 1172, Seq. ID No. 1174, Seq. ID No.  
30 1176, Seq. ID No. 1182, Seq. ID No. 1186, Seq. ID No. 1190, Seq. ID No. 1200,  
Seq. ID No. 1206, Seq. ID No. 1210, Seq. ID No. 1216, Seq. ID No. 1220, Seq.  
ID No. 1224, Seq. ID No. 1226, Seq. ID No. 1234, Seq. ID No. 1236, Seq. ID No.  
1242, Seq. ID No. 1252, Seq. ID No. 1256, Seq. ID No. 1262, Seq. ID No. 1272,

Seq. ID No. 1282, Seq. ID No. 1316, Seq. ID No. 1324, Seq. ID No. 1332, Seq.  
ID No. 1334, Seq. ID No. 1340, Seq. ID No. 1346, Seq. ID No. 1348, Seq. ID No.  
1356, Seq. ID No. 1358, Seq. ID No. 1370, Seq. ID No. 1374, Seq. ID No. 1388,  
Seq. ID No. 1392, Seq. ID No. 1396, Seq. ID No. 1398, Seq. ID No. 1404, Seq.  
5 ID No. 1406, Seq. ID No. 1408, Seq. ID No. 1414, Seq. ID No. 1416, Seq. ID No.  
1418, Seq. ID No. 1426, Seq. ID No. 1428, Seq. ID No. 1430, Seq. ID No. 1432,  
Seq. ID No. 1434, Seq. ID No. 1436, Seq. ID No. 1440, Seq. ID No. 1442, Seq.  
ID No. 1452, Seq. ID No. 1454, Seq. ID No. 1460, Seq. ID No. 1462, Seq. ID No.  
1470, Seq. ID No. 1472, Seq. ID No. 1474, Seq. ID No. 1476, Seq. ID No. 1478,  
10 Seq. ID No. 1484, Seq. ID No. 1488, Seq. ID No. 1490, Seq. ID No. 1494, Seq.  
ID No. 1496, Seq. ID No. 1498, Seq. ID No. 1502, Seq. ID No. 1504, Seq. ID No.  
1508, Seq. ID No. 1510, Seq. ID No. 1518, Seq. ID No. 1522, Seq. ID No. 1528,  
Seq. ID No. 1532, Seq. ID No. 1538, Seq. ID No. 1542, Seq. ID No. 1544, Seq.  
ID No. 1550, Seq. ID No. 1562, Seq. ID No. 1564, Seq. ID No. 1566, Seq. ID No.  
15 1570, Seq. ID No. 1574, Seq. ID No. 1576, Seq. ID No. 1582, Seq. ID No. 1588,  
Seq. ID No. 1592, Seq. ID No. 1596, Seq. ID No. 1598, Seq. ID No. 1606, Seq.  
ID No. 1610, Seq. ID No. 1614, Seq. ID No. 1620, Seq. ID No. 1624, Seq. ID No.  
1628, Seq. ID No. 1630, Seq. ID No. 1636, Seq. ID No. 1642, Seq. ID No. 1648,  
Seq. ID No. 1652, Seq. ID No. 1658, Seq. ID No. 1660, Seq. ID No. 1668, Seq.  
20 ID No. 1670, Seq. ID No. 1680, Seq. ID No. 1684, Seq. ID No. 1688, Seq. ID No.  
1692, Seq. ID No. 1698, Seq. ID No. 1700, Seq. ID No. 1702, Seq. ID No. 1708,  
Seq. ID No. 1710, Seq. ID No. 1714, Seq. ID No. 1718, Seq. ID No. 1722, Seq.  
ID No. 1726, Seq. ID No. 1736, Seq. ID No. 1738, Seq. ID No. 1740, Seq. ID No.  
1744, Seq. ID No. 1746, Seq. ID No. 1750, Seq. ID No. 1756, Seq. ID No. 1770,  
25 Seq. ID No. 1774, Seq. ID No. 1778, Seq. ID No. 1786, Seq. ID No. 1790, Seq.  
ID No. 1792, Seq. ID No. 1798, Seq. ID No. 1800, Seq. ID No. 1804, Seq. ID No.  
1806, Seq. ID No. 1808, Seq. ID No. 1818, Seq. ID No. 1820, Seq. ID No. 1822,  
Seq. ID No. 1826, Seq. ID No. 1828, Seq. ID No. 1832, Seq. ID No. 1836, Seq.  
ID No. 1842, Seq. ID No. 1846, Seq. ID No. 1848, Seq. ID No. 1850, Seq. ID No.  
30 1852, Seq. ID No. 1856, Seq. ID No. 1860, Seq. ID No. 1862, Seq. ID No. 1866,  
Seq. ID No. 1868, Seq. ID No. 1872, Seq. ID No. 1874, Seq. ID No. 1878, Seq.  
ID No. 1880, Seq. ID No. 1888, Seq. ID No. 1890, Seq. ID No. 1896, Seq. ID No.  
1898, Seq. ID No. 1900, Seq. ID No. 1902, Seq. ID No. 1906, Seq. ID No. 1910,

Seq. ID No. 1918, Seq. ID No. 1922, Seq. ID No. 1926, Seq. ID No. 1932, Seq.  
ID No. 1934, Seq. ID No. 1938, Seq. ID No. 1940, Seq. ID No. 1946, Seq. ID No.  
1948, Seq. ID No. 1952, Seq. ID No. 1956, Seq. ID No. 1960, Seq. ID No. 1962,  
Seq. ID No. 1966, Seq. ID No. 1968, Seq. ID No. 1970, Seq. ID No. 1974, Seq.  
5 ID No. 1978, Seq. ID No. 1980, Seq. ID No. 1984, Seq. ID No. 1990, Seq. ID No.  
1992, Seq. ID No. 1998, Seq. ID No. 2002, Seq. ID No. 2004, Seq. ID No. 2012,  
Seq. ID No. 2022, Seq. ID No. 2024, Seq. ID No. 2030, Seq. ID No. 2034, Seq.  
ID No. 2038, Seq. ID No. 2040, Seq. ID No. 2046, Seq. ID No. 2048, Seq. ID No.  
2052, Seq. ID No. 2058, Seq. ID No. 2062, Seq. ID No. 2068, Seq. ID No. 2070,  
10 Seq. ID No. 2072, Seq. ID No. 2074, Seq. ID No. 2078, Seq. ID No. 2090, Seq.  
ID No. 2094, Seq. ID No. 2096, Seq. ID No. 2100, Seq. ID No. 2102, Seq. ID No.  
2114, Seq. ID No. 2118, Seq. ID No. 2124, Seq. ID No. 2136, Seq. ID No. 2138,  
Seq. ID No. 2140, Seq. ID No. 2144, Seq. ID No. 2148, Seq. ID No. 2154, Seq.  
ID No. 2160, Seq. ID No. 2164, Seq. ID No. 2168, Seq. ID No. 2176, Seq. ID No.  
15 2182, Seq. ID No. 2186, Seq. ID No. 2190, Seq. ID No. 2194, Seq. ID No. 2196,  
Seq. ID No. 2198, Seq. ID No. 2206, Seq. ID No. 2218, Seq. ID No. 2220, Seq.  
ID No. 2224, Seq. ID No. 2226, Seq. ID No. 2230, Seq. ID No. 2236, Seq. ID No.  
2240, Seq. ID No. 2244, Seq. ID No. 2246, Seq. ID No. 2248, Seq. ID No. 2254,  
Seq. ID No. 2256, Seq. ID No. 2258, Seq. ID No. 2260, Seq. ID No. 2262, Seq.  
20 ID No. 2266, Seq. ID No. 2270, Seq. ID No. 2274, Seq. ID No. 2286, Seq. ID No.  
2298, Seq. ID No. 2300, Seq. ID No. 2302, Seq. ID No. 2314, Seq. ID No. 2328,  
Seq. ID No. 2332, Seq. ID No. 2336, Seq. ID No. 2338, Seq. ID No. 2342, Seq.  
ID No. 2344, Seq. ID No. 2346, Seq. ID No. 2350, Seq. ID No. 2352, Seq. ID No.  
2358, Seq. ID No. 2360, Seq. ID No. 2362, Seq. ID No. 2366, Seq. ID No. 2370,  
25 Seq. ID No. 2374, Seq. ID No. 2378, Seq. ID No. 2384, Seq. ID No. 2398, Seq.  
ID No. 2402, Seq. ID No. 2404, Seq. ID No. 2410, Seq. ID No. 2412, Seq. ID No.  
2418, Seq. ID No. 2422, Seq. ID No. 2424, Seq. ID No. 2426, Seq. ID No. 2430,  
Seq. ID No. 2436, Seq. ID No. 2438, Seq. ID No. 2440, Seq. ID No. 2442, Seq.  
ID No. 2446, Seq. ID No. 2450, Seq. ID No. 2452, Seq. ID No. 2454, Seq. ID No.  
30 2462, Seq. ID No. 2466, Seq. ID No. 2468, Seq. ID No. 2472, Seq. ID No. 2474,  
Seq. ID No. 2478, Seq. ID No. 2480, Seq. ID No. 2482, Seq. ID No. 2486, Seq.  
ID No. 2488, Seq. ID No. 2496, Seq. ID No. 2506, Seq. ID No. 2508, Seq. ID No.  
2510, Seq. ID No. 2520, Seq. ID No. 2526, Seq. ID No. 2528, Seq. ID No. 2530,

Seq. ID No. 2536, Seq. ID No. 2538, Seq. ID No. 2540, Seq. ID No. 2548, Seq.  
ID No. 2552, Seq. ID No. 2564, Seq. ID No. 2566, Seq. ID No. 2574, Seq. ID No.  
2578, Seq. ID No. 2580, Seq. ID No. 2586, Seq. ID No. 2594, Seq. ID No. 2596,  
Seq. ID No. 2600, Seq. ID No. 2608, Seq. ID No. 2610, Seq. ID No. 2614, Seq.  
5 ID No. 2616, Seq. ID No. 2620, Seq. ID No. 2624, Seq. ID No. 2626, Seq. ID No.  
2632, Seq. ID No. 2634, Seq. ID No. 2640, Seq. ID No. 2642, Seq. ID No. 2644,  
Seq. ID No. 2648, Seq. ID No. 2652, Seq. ID No. 2656, Seq. ID No. 2658, Seq.  
ID No. 2662, Seq. ID No. 2666, Seq. ID No. 2670, Seq. ID No. 2672, Seq. ID No.  
2674, Seq. ID No. 2682, Seq. ID No. 2690, Seq. ID No. 2694, Seq. ID No. 2700,  
10 Seq. ID No. 2704, Seq. ID No. 2710, Seq. ID No. 2712, Seq. ID No. 2714, Seq.  
ID No. 2720, Seq. ID No. 2722, Seq. ID No. 2728, Seq. ID No. 2738, Seq. ID No.  
2742, Seq. ID No. 2746, Seq. ID No. 2750, Seq. ID No. 2754, Seq. ID No. 2758, ..  
Seq. ID No. 2762, Seq. ID No. 2766, Seq. ID No. 2768, Seq. ID No. 2770, Seq.  
ID No. 2774, Seq. ID No. 2776, Seq. ID No. 2778, Seq. ID No. 2788, Seq. ID No.  
15 2790, Seq. ID No. 2792, Seq. ID No. 2794, Seq. ID No. 2796, Seq. ID No. 2800,  
Seq. ID No. 2804, Seq. ID No. 2816, Seq. ID No. 2818, Seq. ID No. 2820, Seq.  
ID No. 2826, Seq. ID No. 2844, Seq. ID No. 2848, Seq. ID No. 2850, Seq. ID No.  
2852, Seq. ID No. 2858, Seq. ID No. 2860, Seq. ID No. 2864, Seq. ID No. 2868,  
Seq. ID No. 2870, Seq. ID No. 2872, Seq. ID No. 2878, Seq. ID No. 2880, Seq.  
20 ID No. 2890, Seq. ID No. 2892, Seq. ID No. 2898, Seq. ID No. 2902, Seq. ID No.  
2904, Seq. ID No. 2908, Seq. ID No. 2910, Seq. ID No. 2914, Seq. ID No. 2916,  
Seq. ID No. 2920, Seq. ID No. 2922, Seq. ID No. 2924, Seq. ID No. 2926, Seq.  
ID No. 2930, Seq. ID No. 2936, Seq. ID No. 2944, Seq. ID No. 2952, Seq. ID No.  
2956, Seq. ID No. 2964, Seq. ID No. 2966, Seq. ID No. 2972, Seq. ID No. 2974,  
25 Seq. ID No. 2976, Seq. ID No. 2980, Seq. ID No. 2982, Seq. ID No. 2986, Seq.  
ID No. 2990, Seq. ID No. 2994, Seq. ID No. 3000, Seq. ID No. 3002, Seq. ID No.  
3004, Seq. ID No. 3018, Seq. ID No. 3028, Seq. ID No. 3034, Seq. ID No. 3036,  
Seq. ID No. 3040, Seq. ID No. 3042, Seq. ID No. 3044, Seq. ID No. 3046, Seq.  
ID No. 3048, Seq. ID No. 3056, Seq. ID No. 3058, Seq. ID No. 3062, Seq. ID No.  
30 3066, Seq. ID No. 3070, Seq. ID No. 3080, Seq. ID No. 3090, Seq. ID No. 3092,  
Seq. ID No. 3094, Seq. ID No. 3096, Seq. ID No. 3104, Seq. ID No. 3106, Seq.  
ID No. 3110, Seq. ID No. 3114, Seq. ID No. 3126, Seq. ID No. 3128, Seq. ID No.  
3136, Seq. ID No. 3138, Seq. ID No. 3142, Seq. ID No. 3144, Seq. ID No. 3148,

Seq. ID No. 3156, Seq. ID No. 3158, Seq. ID No. 3160, Seq. ID No. 3162, Seq.  
ID No. 3166, Seq. ID No. 3170, Seq. ID No. 3176, Seq. ID No. 3180, Seq. ID No.  
3184, Seq. ID No. 3186, Seq. ID No. 3190, Seq. ID No. 3192, Seq. ID No. 3196,  
Seq. ID No. 3200, Seq. ID No. 3206, Seq. ID No. 3212, Seq. ID No. 3218, Seq.  
5 ID No. 3222, Seq. ID No. 3226, Seq. ID No. 3230, Seq. ID No. 3232, Seq. ID No.  
3238, Seq. ID No. 3240, Seq. ID No. 3248, Seq. ID No. 3252, Seq. ID No. 3254,  
Seq. ID No. 3256, Seq. ID No. 3260, Seq. ID No. 3262, Seq. ID No. 3268, Seq.  
ID No. 3274, Seq. ID No. 3278, Seq. ID No. 3280, Seq. ID No. 3286, Seq. ID No.  
3288, Seq. ID No. 3290, Seq. ID No. 3294, Seq. ID No. 3296, Seq. ID No. 3300,  
10 Seq. ID No. 3302, Seq. ID No. 3306, Seq. ID No. 3310, Seq. ID No. 3316, Seq.  
ID No. 3320, Seq. ID No. 3322, Seq. ID No. 3328, Seq. ID No. 3334, Seq. ID No.  
3338, Seq. ID No. 3344, Seq. ID No. 3354, Seq. ID No. 3360, Seq. ID No. 3362,  
Seq. ID No. 3366, Seq. ID No. 3374, Seq. ID No. 3382, Seq. ID No. 3386, Seq.  
ID No. 3394, Seq. ID No. 3402, Seq. ID No. 3408, Seq. ID No. 3412, Seq. ID No.  
15 3416, Seq. ID No. 3418, Seq. ID No. 3424, Seq. ID No. 3430, Seq. ID No. 3438,  
Seq. ID No. 3440, Seq. ID No. 3444, Seq. ID No. 3460, Seq. ID No. 3462, Seq.  
ID No. 3466, Seq. ID No. 3470, Seq. ID No. 3472, Seq. ID No. 3474, Seq. ID No.  
3476, Seq. ID No. 3478, Seq. ID No. 3484, Seq. ID No. 3488, Seq. ID No. 3496,  
Seq. ID No. 3498, Seq. ID No. 3506, Seq. ID No. 3508, Seq. ID No. 3510, Seq.  
20 ID No. 3512, Seq. ID No. 3516, Seq. ID No. 3522, Seq. ID No. 3524, Seq. ID No.  
3530, Seq. ID No. 3536, Seq. ID No. 3542, Seq. ID No. 3552, Seq. ID No. 3560,  
Seq. ID No. 3564, Seq. ID No. 3568, Seq. ID No. 3576, Seq. ID No. 3578, Seq.  
ID No. 3584, Seq. ID No. 3586, Seq. ID No. 3590, Seq. ID No. 3592, Seq. ID No.  
3600, Seq. ID No. 3602, Seq. ID No. 3608, Seq. ID No. 3610, Seq. ID No. 3612,  
25 Seq. ID No. 3616, Seq. ID No. 3620, Seq. ID No. 3630, Seq. ID No. 3632, Seq.  
ID No. 3634, Seq. ID No. 3638, Seq. ID No. 3642, Seq. ID No. 3644, Seq. ID No.  
3646, Seq. ID No. 3652, Seq. ID No. 3654, Seq. ID No. 3656, Seq. ID No. 3662,  
Seq. ID No. 3666, Seq. ID No. 3668, Seq. ID No. 3670, Seq. ID No. 3676, Seq.  
ID No. 3682, Seq. ID No. 3690, Seq. ID No. 3696, Seq. ID No. 3698, Seq. ID No.  
30 3706, Seq. ID No. 3712, Seq. ID No. 3720, Seq. ID No. 3726, Seq. ID No. 3730,  
Seq. ID No. 3732, Seq. ID No. 3736, Seq. ID No. 3740, Seq. ID No. 3742, Seq.  
ID No. 3744, Seq. ID No. 3750, Seq. ID No. 3760, Seq. ID No. 3770, Seq. ID No.  
3774, Seq. ID No. 3778, Seq. ID No. 3782, Seq. ID No. 3788, Seq. ID No. 3796,

Seq. ID No. 3802, Seq. ID No. 3806, Seq. ID No. 3810, Seq. ID No. 3814, Seq.  
ID No. 3820, Seq. ID No. 3822, Seq. ID No. 3826, Seq. ID No. 3828, Seq. ID No.  
3830, Seq. ID No. 3832, Seq. ID No. 3836, Seq. ID No. 3842, Seq. ID No. 3846,  
Seq. ID No. 3856, Seq. ID No. 3858, Seq. ID No. 3864, Seq. ID No. 3868, Seq.  
5 ID No. 3870, Seq. ID No. 3876, Seq. ID No. 3882, Seq. ID No. 3884, Seq. ID No.  
3886, Seq. ID No. 3888, Seq. ID No. 3898, Seq. ID No. 3902, Seq. ID No. 3906,  
Seq. ID No. 3910, Seq. ID No. 3914, Seq. ID No. 3916, Seq. ID No. 3918, Seq.  
ID No. 3920, Seq. ID No. 3922, Seq. ID No. 3930, Seq. ID No. 3932, Seq. ID No.  
3936, Seq. ID No. 3942, Seq. ID No. 3944, Seq. ID No. 3946, Seq. ID No. 3948,  
10 Seq. ID No. 3952, Seq. ID No. 3954, Seq. ID No. 3958, Seq. ID No. 3972, Seq.  
ID No. 3978, Seq. ID No. 3982, Seq. ID No. 3986, Seq. ID No. 3988, Seq. ID No.  
3990, Seq. ID No. 3994, Seq. ID No. 4002, Seq. ID No. 4006, Seq. ID No. 4012,  
Seq. ID No. 4016, Seq. ID No. 4018, Seq. ID No. 4020, Seq. ID No. 4024, Seq.  
ID No. 4030, Seq. ID No. 4032, Seq. ID No. 4034, Seq. ID No. 4038, Seq. ID No.  
15 4040, Seq. ID No. 4050, Seq. ID No. 4052, Seq. ID No. 4058, Seq. ID No. 4060,  
Seq. ID No. 4066, Seq. ID No. 4070, Seq. ID No. 4076, Seq. ID No. 4080, Seq.  
ID No. 4086, Seq. ID No. 4090, Seq. ID No. 4096, Seq. ID No. 4098, Seq. ID No.  
4100, Seq. ID No. 4106, Seq. ID No. 4112, Seq. ID No. 4116, Seq. ID No. 4122,  
Seq. ID No. 4124, Seq. ID No. 4128, Seq. ID No. 4130, Seq. ID No. 4132, Seq.  
20 ID No. 4138, Seq. ID No. 4142, Seq. ID No. 4148, Seq. ID No. 4158, Seq. ID No.  
4160, Seq. ID No. 4164, Seq. ID No. 4166, Seq. ID No. 4170, Seq. ID No. 4180,  
Seq. ID No. 4184, Seq. ID No. 4188, Seq. ID No. 4194, Seq. ID No. 4196, Seq.  
ID No. 4198, Seq. ID No. 4200, Seq. ID No. 4202, Seq. ID No. 4206, Seq. ID No.  
4208, Seq. ID No. 4214, Seq. ID No. 4220, Seq. ID No. 4236, Seq. ID No. 4238,  
25 Seq. ID No. 4240, Seq. ID No. 4244, Seq. ID No. 4246, Seq. ID No. 4256, Seq.  
ID No. 4260, Seq. ID No. 4268, Seq. ID No. 4272, Seq. ID No. 4278, Seq. ID No.  
4280, Seq. ID No. 4282, Seq. ID No. 4284, Seq. ID No. 4290, Seq. ID No. 4294,  
Seq. ID No. 4300, Seq. ID No. 4302, Seq. ID No. 4304, Seq. ID No. 4306, Seq.  
ID No. 4308, Seq. ID No. 4310, Seq. ID No. 4314, Seq. ID No. 4316, Seq. ID No.  
30 4324, Seq. ID No. 4326, Seq. ID No. 4328, Seq. ID No. 4332, Seq. ID No. 4334,  
Seq. ID No. 4338, Seq. ID No. 4342, Seq. ID No. 4346, Seq. ID No. 4350, Seq.  
ID No. 4356, Seq. ID No. 4358, Seq. ID No. 4366, Seq. ID No. 4368, Seq. ID No.  
4372, Seq. ID No. 4376, Seq. ID No. 4378, Seq. ID No. 4380, Seq. ID No. 4384,

Seq. ID No. 4388, Seq. ID No. 4394, Seq. ID No. 4398, Seq. ID No. 4402, Seq.  
ID No. 4410, Seq. ID No. 4414, Seq. ID No. 4422, Seq. ID No. 4434, Seq. ID No.  
4436, Seq. ID No. 4446, Seq. ID No. 4450, Seq. ID No. 4458, Seq. ID No. 4462,  
Seq. ID No. 4464, Seq. ID No. 4472, Seq. ID No. 4476, Seq. ID No. 4478, Seq.  
5 ID No. 4482, Seq. ID No. 4488, Seq. ID No. 4492, Seq. ID No. 4500, Seq. ID No.  
4502, Seq. ID No. 4504, Seq. ID No. 4510, Seq. ID No. 4518, Seq. ID No. 4532,  
Seq. ID No. 4534, Seq. ID No. 4536, Seq. ID No. 4540, Seq. ID No. 4542, Seq.  
ID No. 4546, Seq. ID No. 4550, Seq. ID No. 4558, Seq. ID No. 4564, Seq. ID No.  
4568, Seq. ID No. 4570, Seq. ID No. 4576, Seq. ID No. 4578, Seq. ID No. 4580,  
10 Seq. ID No. 4584, Seq. ID No. 4592, Seq. ID No. 4594, Seq. ID No. 4598, Seq.  
ID No. 4602, Seq. ID No. 4606, Seq. ID No. 4610, Seq. ID No. 4612, Seq. ID No.  
4614, Seq. ID No. 4624, Seq. ID No. 4626, Seq. ID No. 4630, Seq. ID No. 4634,  
Seq. ID No. 4638, Seq. ID No. 4642, Seq. ID No. 4646, Seq. ID No. 4652, Seq.  
ID No. 4654, Seq. ID No. 4656, Seq. ID No. 4662, Seq. ID No. 4664, Seq. ID No.  
15 4670, Seq. ID No. 4672, Seq. ID No. 4674, Seq. ID No. 4676, Seq. ID No. 4686,  
Seq. ID No. 4690, Seq. ID No. 4698, Seq. ID No. 4704, Seq. ID No. 4706, Seq.  
ID No. 4714, Seq. ID No. 4718, Seq. ID No. 4720, Seq. ID No. 4724, Seq. ID No.  
4730, Seq. ID No. 4732, Seq. ID No. 4734, Seq. ID No. 4740, Seq. ID No. 4744,  
Seq. ID No. 4746, Seq. ID No. 4748, Seq. ID No. 4750, Seq. ID No. 4752, Seq.  
20 ID No. 4754, Seq. ID No. 4762, Seq. ID No. 4768, Seq. ID No. 4772, Seq. ID No.  
4780, Seq. ID No. 4782, Seq. ID No. 4784, Seq. ID No. 4786, Seq. ID No. 4790,  
Seq. ID No. 4792, Seq. ID No. 4794, Seq. ID No. 4800, Seq. ID No. 4808, Seq.  
ID No. 4810, Seq. ID No. 4812, Seq. ID No. 4814, Seq. ID No. 4816, Seq. ID No.  
4822, Seq. ID No. 4826, Seq. ID No. 4828, Seq. ID No. 4830, Seq. ID No. 4838,  
25 Seq. ID No. 4840, Seq. ID No. 4846, Seq. ID No. 4848, Seq. ID No. 4850, Seq.  
ID No. 4858, Seq. ID No. 4862, Seq. ID No. 4866, Seq. ID No. 4868, Seq. ID No.  
4876, Seq. ID No. 4880, Seq. ID No. 4882, Seq. ID No. 4884, Seq. ID No. 4886,  
Seq. ID No. 4888, Seq. ID No. 4894, Seq. ID No. 4900, Seq. ID No. 4902, Seq.  
ID No. 4904, Seq. ID No. 4906, Seq. ID No. 4908, Seq. ID No. 4910, Seq. ID No.  
30 4916, Seq. ID No. 4918, Seq. ID No. 4920, Seq. ID No. 4922, Seq. ID No. 4926,  
Seq. ID No. 4930, Seq. ID No. 4934, Seq. ID No. 4938, Seq. ID No. 4942, Seq.  
ID No. 4944, Seq. ID No. 4946, Seq. ID No. 4948, Seq. ID No. 4954, Seq. ID No.  
4956, Seq. ID No. 4960, Seq. ID No. 4962, Seq. ID No. 4966, Seq. ID No. 4968,



Seq. ID No. 4972, Seq. ID No. 4974, Seq. ID No. 4978, Seq. ID No. 4986, Seq.  
ID No. 4990, Seq. ID No. 4992, Seq. ID No. 4996, Seq. ID No. 4998, Seq. ID No.  
5006, Seq. ID No. 5010, Seq. ID No. 5016, Seq. ID No. 5020, Seq. ID No. 5026,  
Seq. ID No. 5030, Seq. ID No. 5038, Seq. ID No. 5046, Seq. ID No. 5050, Seq.  
5 ID No. 5054, Seq. ID No. 5056, Seq. ID No. 5060, Seq. ID No. 5062, Seq. ID No.  
5066, Seq. ID No. 5072, Seq. ID No. 5074, Seq. ID No. 5080, Seq. ID No. 5082,  
Seq. ID No. 5084, Seq. ID No. 5088, Seq. ID No. 5090, Seq. ID No. 5094, Seq.  
ID No. 5096, Seq. ID No. 5104, Seq. ID No. 5106, Seq. ID No. 5108, Seq. ID No.  
5112, Seq. ID No. 5114, Seq. ID No. 5116, Seq. ID No. 5118, Seq. ID No. 5120,  
10 Seq. ID No. 5142, Seq. ID No. 5144, Seq. ID No. 5148, Seq. ID No. 5154, Seq.  
ID No. 5156, Seq. ID No. 5164, Seq. ID No. 5170, Seq. ID No. 5172, Seq. ID No.  
5174, Seq. ID No. 5180, Seq. ID No. 5186, Seq. ID No. 5188, Seq. ID No. 5194,  
Seq. ID No. 5196, Seq. ID No. 5202, Seq. ID No. 5204, Seq. ID No. 5206, Seq.  
ID No. 5210, Seq. ID No. 5212, Seq. ID No. 5214, Seq. ID No. 5218, Seq. ID No.  
15 5226, Seq. ID No. 5232, Seq. ID No. 5234, Seq. ID No. 5238, Seq. ID No. 5240,  
Seq. ID No. 5246, Seq. ID No. 5248, Seq. ID No. 5250, Seq. ID No. 5256, Seq.  
ID No. 5258, Seq. ID No. 5260, Seq. ID No. 5264, Seq. ID No. 5270, Seq. ID No.  
5274, Seq. ID No. 5284, Seq. ID No. 5290, Seq. ID No. 5294, Seq. ID No. 5308,  
Seq. ID No. 5312, Seq. ID No. 5314, Seq. ID No. 5316, Seq. ID No. 5324, Seq.  
20 ID No. 5326, Seq. ID No. 5336, Seq. ID No. 5338, Seq. ID No. 5340, Seq. ID No.  
5346, Seq. ID No. 5348, Seq. ID No. 5350, Seq. ID No. 5354, Seq. ID No. 5362,  
Seq. ID No. 5366, Seq. ID No. 5368, Seq. ID No. 5370, Seq. ID No. 5374, Seq.  
ID No. 5376, Seq. ID No. 5388, Seq. ID No. 5390, Seq. ID No. 5392, Seq. ID No.  
5394, Seq. ID No. 5396, Seq. ID No. 5398, Seq. ID No. 5400, Seq. ID No. 5402,  
25 Seq. ID No. 5404, Seq. ID No. 5406, Seq. ID No. 5412, Seq. ID No. 5416, Seq.  
ID No. 5418, Seq. ID No. 5420, Seq. ID No. 5422, Seq. ID No. 5424, Seq. ID No.  
5430, Seq. ID No. 5434, Seq. ID No. 5442, Seq. ID No. 5444, Seq. ID No. 5446,  
Seq. ID No. 5450, Seq. ID No. 5452, Seq. ID No. 5454, Seq. ID No. 5456, Seq.  
ID No. 5458, Seq. ID No. 5470, Seq. ID No. 5476, Seq. ID No. 5484, Seq. ID No.  
30 5486, Seq. ID No. 5490, Seq. ID No. 5494, Seq. ID No. 5500, Seq. ID No. 5502,  
Seq. ID No. 5506, Seq. ID No. 5510, Seq. ID No. 5512, Seq. ID No. 5524, Seq.  
ID No. 5530, Seq. ID No. 5536, Seq. ID No. 5540, Seq. ID No. 5542, Seq. ID No.  
5548, Seq. ID No. 5552, Seq. ID No. 5556, Seq. ID No. 5560, Seq. ID No. 5562,

Seq. ID No. 5566, Seq. ID No. 5572, Seq. ID No. 5574, Seq. ID No. 5580, Seq.  
ID No. 5584, Seq. ID No. 5590, Seq. ID No. 5600, Seq. ID No. 5602, Seq. ID No.  
5604, Seq. ID No. 5614, Seq. ID No. 5622, Seq. ID No. 5628, Seq. ID No. 5632,  
Seq. ID No. 5636, Seq. ID No. 5646, Seq. ID No. 5652, Seq. ID No. 5654, Seq.  
5 ID No. 5658, Seq. ID No. 5662, Seq. ID No. 5664, Seq. ID No. 5666, Seq. ID No.  
5670, Seq. ID No. 5672, Seq. ID No. 5674, Seq. ID No. 5676, Seq. ID No. 5682,  
Seq. ID No. 5694, Seq. ID No. 5696, Seq. ID No. 5700, Seq. ID No. 5702, Seq.  
ID No. 5708, Seq. ID No. 5714, Seq. ID No. 5718, Seq. ID No. 5724, Seq. ID No.  
5726, Seq. ID No. 5732, Seq. ID No. 5738, Seq. ID No. 5748, Seq. ID No. 5752,  
10 Seq. ID No. 5756, Seq. ID No. 5760, Seq. ID No. 5772, Seq. ID No. 5774, Seq.  
ID No. 5778, Seq. ID No. 5780, Seq. ID No. 5782, Seq. ID No. 5786, Seq. ID No.  
5794, Seq. ID No. 5800, Seq. ID No. 5806, Seq. ID No. 5812, Seq. ID No. 5816,  
Seq. ID No. 5818, Seq. ID No. 5824, Seq. ID No. 5832, Seq. ID No. 5836, Seq.  
ID No. 5840, Seq. ID No. 5844, Seq. ID No. 5848, Seq. ID No. 5850, Seq. ID No.  
15 5852, Seq. ID No. 5854, Seq. ID No. 5856, Seq. ID No. 5858, Seq. ID No. 5862,  
Seq. ID No. 5868, Seq. ID No. 5876, Seq. ID No. 5878, Seq. ID No. 5882, Seq.  
ID No. 5890, Seq. ID No. 5896, Seq. ID No. 5898, Seq. ID No. 5902, Seq. ID No.  
5904, Seq. ID No. 5908, Seq. ID No. 5914, Seq. ID No. 5916, Seq. ID No. 5918,  
Seq. ID No. 5920, Seq. ID No. 5926, Seq. ID No. 5932, Seq. ID No. 5934, Seq.  
20 ID No. 5936, Seq. ID No. 5942, Seq. ID No. 5944, Seq. ID No. 5946, Seq. ID No.  
5950, Seq. ID No. 5956, Seq. ID No. 5958, Seq. ID No. 5960, Seq. ID No. 5968,  
Seq. ID No. 5972, Seq. ID No. 5976, Seq. ID No. 5978, Seq. ID No. 5982, Seq.  
ID No. 5984, Seq. ID No. 5986, Seq. ID No. 5990, Seq. ID No. 5992, Seq. ID No.  
5996, Seq. ID No. 5998, Seq. ID No. 6004, Seq. ID No. 6006, Seq. ID No. 6008,  
25 Seq. ID No. 6016, Seq. ID No. 6018, Seq. ID No. 6020, Seq. ID No. 6024, Seq.  
ID No. 6030, Seq. ID No. 6034, Seq. ID No. 6036, Seq. ID No. 6038, Seq. ID No.  
6044, Seq. ID No. 6050, Seq. ID No. 6056, Seq. ID No. 6066, Seq. ID No. 6070,  
Seq. ID No. 6076, Seq. ID No. 6082, Seq. ID No. 6084, Seq. ID No. 6088, Seq.  
ID No. 6096, Seq. ID No. 6098, Seq. ID No. 6100, Seq. ID No. 6104, Seq. ID No.  
30 6106, Seq. ID No. 6114, Seq. ID No. 6116, Seq. ID No. 6120, Seq. ID No. 6126,  
Seq. ID No. 6128, Seq. ID No. 6130, Seq. ID No. 6132, Seq. ID No. 6134, Seq.  
ID No. 6142, Seq. ID No. 6144, Seq. ID No. 6148, Seq. ID No. 6154, Seq. ID No.  
6166, Seq. ID No. 6170, Seq. ID No. 6172, Seq. ID No. 6174, Seq. ID No. 6178,

Seq. ID No. 6180, Seq. ID No. 6188, Seq. ID No. 6194, Seq. ID No. 6202, Seq. ID No. 6208, Seq. ID No. 6212, Seq. ID No. 6216, Seq. ID No. 6220, Seq. ID No. 6232, Seq. ID No. 6236, Seq. ID No. 6244, Seq. ID No. 6248, Seq. ID No. 6252, Seq. ID No. 6256, Seq. ID No. 6262, Seq. ID No. 6264, Seq. ID No. 6270, Seq. ID No. 6276, Seq. ID No. 6278, Seq. ID No. 6280, Seq. ID No. 6288, Seq. ID No. 6292, Seq. ID No. 6300, Seq. ID No. 6306, Seq. ID No. 6308, Seq. ID No. 6314, Seq. ID No. 6316, Seq. ID No. 6322, Seq. ID No. 6324, Seq. ID No. 6326, Seq. ID No. 6332, Seq. ID No. 6336, Seq. ID No. 6340, Seq. ID No. 6342, Seq. ID No. 6344, Seq. ID No. 6346, Seq. ID No. 6348, Seq. ID No. 6356, Seq. ID No. 6360, Seq. ID No. 6362, Seq. ID No. 6366, Seq. ID No. 6370, Seq. ID No. 6372, Seq. ID No. 6376, Seq. ID No. 6378, Seq. ID No. 6380, Seq. ID No. 6388, Seq. ID No. 6392, Seq. ID No. 6398, Seq. ID No. 6402, Seq. ID No. 6406, Seq. ID No. 6410, Seq. ID No. 6414, Seq. ID No. 6418, Seq. ID No. 6420, Seq. ID No. 6424, Seq. ID No. 6430, Seq. ID No. 6434, Seq. ID No. 6436, Seq. ID No. 6440, Seq. ID No. 6446, Seq. ID No. 6448, Seq. ID No. 6452, Seq. ID No. 6456, Seq. ID No. 6460, Seq. ID No. 6462, Seq. ID No. 6464, Seq. ID No. 6476, Seq. ID No. 6482, Seq. ID No. 6484, Seq. ID No. 6486, Seq. ID No. 6488, Seq. ID No. 6490, Seq. ID No. 6492, Seq. ID No. 6494, Seq. ID No. 6496, Seq. ID No. 6500, Seq. ID No. 6506, Seq. ID No. 6510, Seq. ID No. 6514, Seq. ID No. 6520, Seq. ID No. 6522, Seq. ID No. 6526, Seq. ID No. 6528, Seq. ID No. 6532, Seq. ID No. 6534, Seq. ID No. 6536, Seq. ID No. 6546, Seq. ID No. 6552, Seq. ID No. 6554, Seq. ID No. 6560, Seq. ID No. 6562, Seq. ID No. 6564, Seq. ID No. 6566, Seq. ID No. 6568, Seq. ID No. 6570, Seq. ID No. 6576, Seq. ID No. 6580, Seq. ID No. 6584, Seq. ID No. 6586, Seq. ID No. 6592, Seq. ID No. 6596, Seq. ID No. 6606, Seq. ID No. 6608, Seq. ID No. 6612, Seq. ID No. 6616, Seq. ID No. 6618, Seq. ID No. 6620, Seq. ID No. 6624, Seq. ID No. 6626, Seq. ID No. 6630, Seq. ID No. 6634, Seq. ID No. 6636, Seq. ID No. 6642, and Seq. ID No. 6648.

54. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is identified as an *Alloiococcus otitidis* polypeptide identified by an ORF finder program that searches for an ATG, GTG or TTG start codon between a Stop-Stop region, and is selected from one of Seq. ID No. 2, Seq. ID No. 6, Seq. ID No. 12, Seq. ID No. 14, Seq. ID No. 16, Seq. ID No. 18, Seq. ID No. 20, Seq. ID

No. 22, Seq. ID No. 24, Seq. ID No. 28, Seq. ID No. 30, Seq. ID No. 32, Seq. ID  
No. 36, Seq. ID No. 38, Seq. ID No. 42, Seq. ID No. 44, Seq. ID No. 46, Seq. ID  
No. 48, Seq. ID No. 50, Seq. ID No. 52, Seq. ID No. 54, Seq. ID No. 56, Seq. ID  
No. 58, Seq. ID No. 60, Seq. ID No. 66, Seq. ID No. 68, Seq. ID No. 76, Seq. ID  
5 No. 78, Seq. ID No. 80, Seq. ID No. 82, Seq. ID No. 84, Seq. ID No. 90, Seq. ID  
No. 92, Seq. ID No. 94, Seq. ID No. 98, Seq. ID No. 100, Seq. ID No. 104, Seq.  
ID No. 106, Seq. ID No. 108, Seq. ID No. 110, Seq. ID No. 112, Seq. ID No. 114,  
Seq. ID No. 116, Seq. ID No. 118, Seq. ID No. 120, Seq. ID No. 122, Seq. ID No.  
128, Seq. ID No. 130, Seq. ID No. 132, Seq. ID No. 134, Seq. ID No. 136, Seq.  
10 ID No. 138, Seq. ID No. 140, Seq. ID No. 144, Seq. ID No. 146, Seq. ID No. 148,  
Seq. ID No. 150, Seq. ID No. 154, Seq. ID No. 156, Seq. ID No. 158, Seq. ID No.  
160, Seq. ID No. 162, Seq. ID No. 164, Seq. ID No. 166, Seq. ID No. 168, Seq.  
ID No. 170, Seq. ID No. 172, Seq. ID No. 176, Seq. ID No. 178, Seq. ID No. 180,  
Seq. ID No. 182, Seq. ID No. 184, Seq. ID No. 188, Seq. ID No. 192, Seq. ID No.  
15 194, Seq. ID No. 196, Seq. ID No. 202, Seq. ID No. 206, Seq. ID No. 208, Seq.  
ID No. 216, Seq. ID No. 220, Seq. ID No. 222, Seq. ID No. 224, Seq. ID No. 226,  
Seq. ID No. 228, Seq. ID No. 232, Seq. ID No. 234, Seq. ID No. 240, Seq. ID No.  
244, Seq. ID No. 246, Seq. ID No. 248, Seq. ID No. 254, Seq. ID No. 258, Seq.  
ID No. 260, Seq. ID No. 262, Seq. ID No. 264, Seq. ID No. 266, Seq. ID No. 268,  
20 Seq. ID No. 270, Seq. ID No. 274, Seq. ID No. 278, Seq. ID No. 280, Seq. ID No.  
282, Seq. ID No. 284, Seq. ID No. 292, Seq. ID No. 294, Seq. ID No. 298, Seq.  
ID No. 302, Seq. ID No. 306, Seq. ID No. 308, Seq. ID No. 310, Seq. ID No. 314,  
Seq. ID No. 318, Seq. ID No. 322, Seq. ID No. 324, Seq. ID No. 326, Seq. ID No.  
332, Seq. ID No. 334, Seq. ID No. 336, Seq. ID No. 338, Seq. ID No. 340, Seq.  
25 ID No. 344, Seq. ID No. 346, Seq. ID No. 348, Seq. ID No. 350, Seq. ID No. 354,  
Seq. ID No. 356, Seq. ID No. 358, Seq. ID No. 360, Seq. ID No. 362, Seq. ID No.  
364, Seq. ID No. 366, Seq. ID No. 368, Seq. ID No. 370, Seq. ID No. 372, Seq.  
ID No. 376, Seq. ID No. 378, Seq. ID No. 380, Seq. ID No. 384, Seq. ID No. 386,  
Seq. ID No. 388, Seq. ID No. 390, Seq. ID No. 392, Seq. ID No. 394, Seq. ID No.  
30 398, Seq. ID No. 402, Seq. ID No. 404, Seq. ID No. 406, Seq. ID No. 408, Seq.  
ID No. 410, Seq. ID No. 416, Seq. ID No. 424, Seq. ID No. 426, Seq. ID No. 428,  
Seq. ID No. 430, Seq. ID No. 432, Seq. ID No. 434, Seq. ID No. 436, Seq. ID No.  
438, Seq. ID No. 440, Seq. ID No. 442, Seq. ID No. 444, Seq. ID No. 446, Seq.

5 ID No. 448, Seq. ID No. 452, Seq. ID No. 454, Seq. ID No. 456, Seq. ID No. 458,  
Seq. ID No. 462, Seq. ID No. 464, Seq. ID No. 468, Seq. ID No. 470, Seq. ID No.  
472, Seq. ID No. 474, Seq. ID No. 476, Seq. ID No. 478, Seq. ID No. 480, Seq.  
ID No. 482, Seq. ID No. 484, Seq. ID No. 486, Seq. ID No. 490, Seq. ID No. 492,  
Seq. ID No. 494, Seq. ID No. 496, Seq. ID No. 502, Seq. ID No. 506, Seq. ID No.  
10 508, Seq. ID No. 512, Seq. ID No. 516, Seq. ID No. 518, Seq. ID No. 524, Seq.  
ID No. 530, Seq. ID No. 532, Seq. ID No. 534, Seq. ID No. 538, Seq. ID No. 540,  
Seq. ID No. 544, Seq. ID No. 548, Seq. ID No. 550, Seq. ID No. 552, Seq. ID No.  
554, Seq. ID No. 556, Seq. ID No. 558, Seq. ID No. 560, Seq. ID No. 562, Seq.  
ID No. 566, Seq. ID No. 570, Seq. ID No. 572, Seq. ID No. 574, Seq. ID No. 576,  
Seq. ID No. 580, Seq. ID No. 582, Seq. ID No. 586, Seq. ID No. 588, Seq. ID No.  
15 590, Seq. ID No. 592, Seq. ID No. 594, Seq. ID No. 596, Seq. ID No. 598, Seq.  
ID No. 600, Seq. ID No. 602, Seq. ID No. 604, Seq. ID No. 606, Seq. ID No. 610,  
Seq. ID No. 614, Seq. ID No. 616, Seq. ID No. 618, Seq. ID No. 620, Seq. ID No.  
622, Seq. ID No. 624, Seq. ID No. 626, Seq. ID No. 628, Seq. ID No. 636, Seq.  
ID No. 638, Seq. ID No. 644, Seq. ID No. 646, Seq. ID No. 648, Seq. ID No. 650,  
Seq. ID No. 656, Seq. ID No. 664, Seq. ID No. 666, Seq. ID No. 668, Seq. ID No.  
20 670, Seq. ID No. 676, Seq. ID No. 682, Seq. ID No. 684, Seq. ID No. 688, Seq.  
ID No. 690, Seq. ID No. 692, Seq. ID No. 696, Seq. ID No. 698, Seq. ID No. 700,  
Seq. ID No. 702, Seq. ID No. 704, Seq. ID No. 706, Seq. ID No. 708, Seq. ID No.  
710, Seq. ID No. 714, Seq. ID No. 726, Seq. ID No. 728, Seq. ID No. 730, Seq.  
ID No. 732, Seq. ID No. 734, Seq. ID No. 736, Seq. ID No. 740, Seq. ID No. 742,  
Seq. ID No. 746, Seq. ID No. 748, Seq. ID No. 750, Seq. ID No. 752, Seq. ID No.  
25 754, Seq. ID No. 760, Seq. ID No. 764, Seq. ID No. 766, Seq. ID No. 774, Seq.  
ID No. 776, Seq. ID No. 782, Seq. ID No. 784, Seq. ID No. 788, Seq. ID No. 794,  
Seq. ID No. 796, Seq. ID No. 800, Seq. ID No. 802, Seq. ID No. 806, Seq. ID No.  
808, Seq. ID No. 810, Seq. ID No. 812, Seq. ID No. 814, Seq. ID No. 816, Seq.  
ID No. 818, Seq. ID No. 820, Seq. ID No. 822, Seq. ID No. 824, Seq. ID No. 828,  
Seq. ID No. 830, Seq. ID No. 832, Seq. ID No. 836, Seq. ID No. 838, Seq. ID No.  
30 840, Seq. ID No. 844, Seq. ID No. 846, Seq. ID No. 848, Seq. ID No. 856, Seq.  
ID No. 860, Seq. ID No. 862, Seq. ID No. 866, Seq. ID No. 868, Seq. ID No. 872,  
Seq. ID No. 874, Seq. ID No. 876, Seq. ID No. 878, Seq. ID No. 880, Seq. ID No.  
882, Seq. ID No. 886, Seq. ID No. 896, Seq. ID No. 898, Seq. ID No. 900, Seq.

5 ID No. 902, Seq. ID No. 904, Seq. ID No. 906, Seq. ID No. 908, Seq. ID No. 910,  
Seq. ID No. 914, Seq. ID No. 916, Seq. ID No. 922, Seq. ID No. 924, Seq. ID No.  
926, Seq. ID No. 932, Seq. ID No. 934, Seq. ID No. 936, Seq. ID No. 938, Seq.  
ID No. 940, Seq. ID No. 942, Seq. ID No. 944, Seq. ID No. 948, Seq. ID No. 950,  
10 Seq. ID No. 952, Seq. ID No. 954, Seq. ID No. 956, Seq. ID No. 958, Seq. ID No.  
962, Seq. ID No. 964, Seq. ID No. 966, Seq. ID No. 968, Seq. ID No. 970, Seq.  
ID No. 972, Seq. ID No. 974, Seq. ID No. 976, Seq. ID No. 982, Seq. ID No. 984,  
Seq. ID No. 986, Seq. ID No. 988, Seq. ID No. 990, Seq. ID No. 992, Seq. ID No.  
994, Seq. ID No. 996, Seq. ID No. 998, Seq. ID No. 1002, Seq. ID No. 1004, Seq.  
15 ID No. 1006, Seq. ID No. 1008, Seq. ID No. 1010, Seq. ID No. 1018, Seq. ID No.  
1020, Seq. ID No. 1024, Seq. ID No. 1026, Seq. ID No. 1028, Seq. ID No. 1040,  
Seq. ID No. 1042, Seq. ID No. 1044, Seq. ID No. 1046, Seq. ID No. 1048, Seq.  
ID No. 1050, Seq. ID No. 1052, Seq. ID No. 1058, Seq. ID No. 1060, Seq. ID No.  
1062, Seq. ID No. 1066, Seq. ID No. 1070, Seq. ID No. 1076, Seq. ID No. 1078,  
20 Seq. ID No. 1080, Seq. ID No. 1082, Seq. ID No. 1084, Seq. ID No. 1086, Seq.  
ID No. 1088, Seq. ID No. 1092, Seq. ID No. 1094, Seq. ID No. 1096, Seq. ID No.  
1098, Seq. ID No. 1100, Seq. ID No. 1102, Seq. ID No. 1104, Seq. ID No. 1108,  
Seq. ID No. 1110, Seq. ID No. 1112, Seq. ID No. 1114, Seq. ID No. 1116, Seq.  
ID No. 1120, Seq. ID No. 1122, Seq. ID No. 1124, Seq. ID No. 1126, Seq. ID No.  
25 1128, Seq. ID No. 1130, Seq. ID No. 1132, Seq. ID No. 1138, Seq. ID No. 1140,  
Seq. ID No. 1142, Seq. ID No. 1144, Seq. ID No. 1146, Seq. ID No. 1148, Seq.  
ID No. 1150, Seq. ID No. 1152, Seq. ID No. 1154, Seq. ID No. 1156, Seq. ID No.  
1158, Seq. ID No. 1160, Seq. ID No. 1162, Seq. ID No. 1164, Seq. ID No. 1172,  
Seq. ID No. 1176, Seq. ID No. 1178, Seq. ID No. 1180, Seq. ID No. 1182, Seq.  
30 ID No. 1188, Seq. ID No. 1192, Seq. ID No. 1194, Seq. ID No. 1196, Seq. ID No.  
1198, Seq. ID No. 1202, Seq. ID No. 1204, Seq. ID No. 1206, Seq. ID No. 1208,  
Seq. ID No. 1212, Seq. ID No. 1214, Seq. ID No. 1216, Seq. ID No. 1218, Seq.  
ID No. 1222, Seq. ID No. 1224, Seq. ID No. 1226, Seq. ID No. 1232, Seq. ID No.  
1234, Seq. ID No. 1238, Seq. ID No. 1240, Seq. ID No. 1242, Seq. ID No. 1246,  
Seq. ID No. 1248, Seq. ID No. 1250, Seq. ID No. 1252, Seq. ID No. 1254, Seq.  
ID No. 1256, Seq. ID No. 1258, Seq. ID No. 1260, Seq. ID No. 1262, Seq. ID No.  
1264, Seq. ID No. 1272, Seq. ID No. 1274, Seq. ID No. 1276, Seq. ID No. 1278,  
Seq. ID No. 1280, Seq. ID No. 1286, Seq. ID No. 1290, Seq. ID No. 1292, Seq.

5 ID No. 1294, Seq. ID No. 1296, Seq. ID No. 1298, Seq. ID No. 1300, Seq. ID No. 1302, Seq. ID No. 1304, Seq. ID No. 1306, Seq. ID No. 1308, Seq. ID No. 1310, Seq. ID No. 1312, Seq. ID No. 1314, Seq. ID No. 1318, Seq. ID No. 1320, Seq. ID No. 1322, Seq. ID No. 1332, Seq. ID No. 1334, Seq. ID No. 1336, Seq. ID No. 1338, Seq. ID No. 1340, Seq. ID No. 1344, Seq. ID No. 1346, Seq. ID No. 1348, Seq. ID No. 1350, Seq. ID No. 1352, Seq. ID No. 1360, Seq. ID No. 1362, Seq. ID No. 1364, Seq. ID No. 1366, Seq. ID No. 1370, Seq. ID No. 1372, Seq. ID No. 1376, Seq. ID No. 1378, Seq. ID No. 1382, Seq. ID No. 1384, Seq. ID No. 1386, Seq. ID No. 1388, Seq. ID No. 1390, Seq. ID No. 1392, Seq. ID No. 1394, Seq. ID No. 1402, Seq. ID No. 1404, Seq. ID No. 1408, Seq. ID No. 1410, Seq. ID No. 1412, Seq. ID No. 1414, Seq. ID No. 1416, Seq. ID No. 1420, Seq. ID No. 1422, Seq. ID No. 1424, Seq. ID No. 1426, Seq. ID No. 1428, Seq. ID No. 1430, Seq. ID No. 1434, Seq. ID No. 1438, Seq. ID No. 1442, Seq. ID No. 1444, Seq. ID No. 1448, Seq. ID No. 1450, Seq. ID No. 1452, Seq. ID No. 1456, Seq. ID No. 1460, Seq. ID No. 1464, Seq. ID No. 1466, Seq. ID No. 1468, Seq. ID No. 1470, Seq. ID No. 1472, Seq. ID No. 1474, Seq. ID No. 1476, Seq. ID No. 1478, Seq. ID No. 1480, Seq. ID No. 1484, Seq. ID No. 1486, Seq. ID No. 1488, Seq. ID No. 1492, Seq. ID No. 1494, Seq. ID No. 1496, Seq. ID No. 1498, Seq. ID No. 1500, Seq. ID No. 1502, Seq. ID No. 1506, Seq. ID No. 1508, Seq. ID No. 1512, Seq. ID No. 1518, Seq. ID No. 1520, Seq. ID No. 1524, Seq. ID No. 1526, Seq. ID No. 1528, Seq. ID No. 1532, Seq. ID No. 1540, Seq. ID No. 1544, Seq. ID No. 1550, Seq. ID No. 1552, Seq. ID No. 1554, Seq. ID No. 1556, Seq. ID No. 1558, Seq. ID No. 1562, Seq. ID No. 1564, Seq. ID No. 1566, Seq. ID No. 1568, Seq. ID No. 1572, Seq. ID No. 1574, Seq. ID No. 1576, Seq. ID No. 1578, Seq. ID No. 1580, Seq. ID No. 1582, Seq. ID No. 1590, Seq. ID No. 1594, Seq. ID No. 1596, Seq. ID No. 1598, Seq. ID No. 1600, Seq. ID No. 1602, Seq. ID No. 1608, Seq. ID No. 1612, Seq. ID No. 1614, Seq. ID No. 1616, Seq. ID No. 1618, Seq. ID No. 1620, Seq. ID No. 1624, Seq. ID No. 1626, Seq. ID No. 1628, Seq. ID No. 1634, Seq. ID No. 1638, Seq. ID No. 1640, Seq. ID No. 1642, Seq. ID No. 1644, Seq. ID No. 1648, Seq. ID No. 1652, Seq. ID No. 1654, Seq. ID No. 1656, Seq. ID No. 1658, Seq. ID No. 1662, Seq. ID No. 1664, Seq. ID No. 1666, Seq. ID No. 1670, Seq. ID No. 1676, Seq. ID No. 1680, Seq. ID No. 1682, Seq. ID No. 1686, Seq. ID No. 1688, Seq. ID No. 1690, Seq. ID No. 1692, Seq. ID No. 1694, Seq. ID No. 1696, Seq.

5 ID No. 1698, Seq. ID No. 1700, Seq. ID No. 1704, Seq. ID No. 1706, Seq. ID No.  
1708, Seq. ID No. 1712, Seq. ID No. 1714, Seq. ID No. 1716, Seq. ID No. 1718,  
Seq. ID No. 1720, Seq. ID No. 1722, Seq. ID No. 1724, Seq. ID No. 1728, Seq.  
10 ID No. 1730, Seq. ID No. 1736, Seq. ID No. 1738, Seq. ID No. 1740, Seq. ID No.  
1742, Seq. ID No. 1748, Seq. ID No. 1750, Seq. ID No. 1752, Seq. ID No. 1756,  
Seq. ID No. 1758, Seq. ID No. 1760, Seq. ID No. 1764, Seq. ID No. 1770, Seq.  
ID No. 1772, Seq. ID No. 1776, Seq. ID No. 1778, Seq. ID No. 1780, Seq. ID No.  
1782, Seq. ID No. 1784, Seq. ID No. 1786, Seq. ID No. 1790, Seq. ID No. 1792,  
Seq. ID No. 1794, Seq. ID No. 1796, Seq. ID No. 1798, Seq. ID No. 1806, Seq.  
15 ID No. 1810, Seq. ID No. 1812, Seq. ID No. 1814, Seq. ID No. 1816, Seq. ID No.  
1818, Seq. ID No. 1820, Seq. ID No. 1822, Seq. ID No. 1824, Seq. ID No. 1826,  
Seq. ID No. 1830, Seq. ID No. 1834, Seq. ID No. 1842, Seq. ID No. 1844, Seq.  
ID No. 1846, Seq. ID No. 1848, Seq. ID No. 1850, Seq. ID No. 1854, Seq. ID No.  
1856, Seq. ID No. 1858, Seq. ID No. 1860, Seq. ID No. 1862, Seq. ID No. 1864,  
Seq. ID No. 1866, Seq. ID No. 1868, Seq. ID No. 1872, Seq. ID No. 1874, Seq.  
ID No. 1876, Seq. ID No. 1878, Seq. ID No. 1882, Seq. ID No. 1884, Seq. ID No.  
1886, Seq. ID No. 1888, Seq. ID No. 1890, Seq. ID No. 1896, Seq. ID No. 1904,  
Seq. ID No. 1906, Seq. ID No. 1908, Seq. ID No. 1912, Seq. ID No. 1914, Seq.  
ID No. 1916, Seq. ID No. 1920, Seq. ID No. 1924, Seq. ID No. 1926, Seq. ID No.  
20 1928, Seq. ID No. 1930, Seq. ID No. 1932, Seq. ID No. 1936, Seq. ID No. 1942,  
Seq. ID No. 1944, Seq. ID No. 1946, Seq. ID No. 1948, Seq. ID No. 1950, Seq.  
ID No. 1952, Seq. ID No. 1954, Seq. ID No. 1960, Seq. ID No. 1962, Seq. ID No.  
1964, Seq. ID No. 1966, Seq. ID No. 1968, Seq. ID No. 1970, Seq. ID No. 1972,  
Seq. ID No. 1980, Seq. ID No. 1984, Seq. ID No. 1986, Seq. ID No. 1988, Seq.  
25 ID No. 1990, Seq. ID No. 1992, Seq. ID No. 1996, Seq. ID No. 1998, Seq. ID No.  
2000, Seq. ID No. 2002, Seq. ID No. 2004, Seq. ID No. 2006, Seq. ID No. 2008,  
Seq. ID No. 2016, Seq. ID No. 2020, Seq. ID No. 2022, Seq. ID No. 2026, Seq.  
ID No. 2028, Seq. ID No. 2030, Seq. ID No. 2032, Seq. ID No. 2036, Seq. ID No.  
2038, Seq. ID No. 2042, Seq. ID No. 2044, Seq. ID No. 2046, Seq. ID No. 2048,  
30 Seq. ID No. 2054, Seq. ID No. 2056, Seq. ID No. 2060, Seq. ID No. 2064, Seq.  
ID No. 2066, Seq. ID No. 2068, Seq. ID No. 2070, Seq. ID No. 2072, Seq. ID No.  
2074, Seq. ID No. 2076, Seq. ID No. 2078, Seq. ID No. 2080, Seq. ID No. 2082,  
Seq. ID No. 2084, Seq. ID No. 2086, Seq. ID No. 2090, Seq. ID No. 2092, Seq.



5 ID No. 2094, Seq. ID No. 2098, Seq. ID No. 2100, Seq. ID No. 2102, Seq. ID No.  
2104, Seq. ID No. 2108, Seq. ID No. 2110, Seq. ID No. 2112, Seq. ID No. 2116,  
Seq. ID No. 2118, Seq. ID No. 2120, Seq. ID No. 2126, Seq. ID No. 2128, Seq.  
ID No. 2130, Seq. ID No. 2132, Seq. ID No. 2134, Seq. ID No. 2136, Seq. ID No.  
2138, Seq. ID No. 2142, Seq. ID No. 2144, Seq. ID No. 2146, Seq. ID No. 2150,  
Seq. ID No. 2152, Seq. ID No. 2154, Seq. ID No. 2156, Seq. ID No. 2158, Seq.  
ID No. 2160, Seq. ID No. 2162, Seq. ID No. 2166, Seq. ID No. 2168, Seq. ID No.  
2170, Seq. ID No. 2180, Seq. ID No. 2182, Seq. ID No. 2184, Seq. ID No. 2190,  
Seq. ID No. 2192, Seq. ID No. 2196, Seq. ID No. 2198, Seq. ID No. 2200, Seq.  
10 ID No. 2202, Seq. ID No. 2204, Seq. ID No. 2206, Seq. ID No. 2208, Seq. ID No.  
2210, Seq. ID No. 2212, Seq. ID No. 2214, Seq. ID No. 2216, Seq. ID No. 2218,  
Seq. ID No. 2222, Seq. ID No. 2224, Seq. ID No. 2228, Seq. ID No. 2230, Seq.  
ID No. 2236, Seq. ID No. 2242, Seq. ID No. 2246, Seq. ID No. 2248, Seq. ID No.  
2252, Seq. ID No. 2254, Seq. ID No. 2258, Seq. ID No. 2260, Seq. ID No. 2262,  
15 Seq. ID No. 2264, Seq. ID No. 2266, Seq. ID No. 2268, Seq. ID No. 2270, Seq.  
ID No. 2276, Seq. ID No. 2278, Seq. ID No. 2280, Seq. ID No. 2286, Seq. ID No.  
2288, Seq. ID No. 2298, Seq. ID No. 2300, Seq. ID No. 2302, Seq. ID No. 2310,  
Seq. ID No. 2312, Seq. ID No. 2316, Seq. ID No. 2328, Seq. ID No. 2330, Seq.  
ID No. 2334, Seq. ID No. 2344, Seq. ID No. 2346, Seq. ID No. 2350, Seq. ID No.  
20 2352, Seq. ID No. 2358, Seq. ID No. 2364, Seq. ID No. 2366, Seq. ID No. 2368,  
Seq. ID No. 2370, Seq. ID No. 2372, Seq. ID No. 2374, Seq. ID No. 2376, Seq.  
ID No. 2380, Seq. ID No. 2382, Seq. ID No. 2386, Seq. ID No. 2388, Seq. ID No.  
2392, Seq. ID No. 2394, Seq. ID No. 2396, Seq. ID No. 2398, Seq. ID No. 2400,  
Seq. ID No. 2402, Seq. ID No. 2406, Seq. ID No. 2410, Seq. ID No. 2414, Seq.  
25 ID No. 2416, Seq. ID No. 2418, Seq. ID No. 2422, Seq. ID No. 2424, Seq. ID No.  
2426, Seq. ID No. 2428, Seq. ID No. 2430, Seq. ID No. 2436, Seq. ID No. 2438,  
Seq. ID No. 2446, Seq. ID No. 2448, Seq. ID No. 2450, Seq. ID No. 2452, Seq.  
ID No. 2454, Seq. ID No. 2456, Seq. ID No. 2458, Seq. ID No. 2460, Seq. ID No.  
2462, Seq. ID No. 2464, Seq. ID No. 2466, Seq. ID No. 2470, Seq. ID No. 2472,  
30 Seq. ID No. 2476, Seq. ID No. 2482, Seq. ID No. 2484, Seq. ID No. 2486, Seq.  
ID No. 2492, Seq. ID No. 2494, Seq. ID No. 2496, Seq. ID No. 2500, Seq. ID No.  
2502, Seq. ID No. 2504, Seq. ID No. 2506, Seq. ID No. 2508, Seq. ID No. 2512,  
Seq. ID No. 2514, Seq. ID No. 2518, Seq. ID No. 2520, Seq. ID No. 2522, Seq.

5 ID No. 2526, Seq. ID No. 2530, Seq. ID No. 2534, Seq. ID No. 2536, Seq. ID No.  
2538, Seq. ID No. 2540, Seq. ID No. 2548, Seq. ID No. 2550, Seq. ID No. 2552,  
Seq. ID No. 2554, Seq. ID No. 2560, Seq. ID No. 2562, Seq. ID No. 2564, Seq.  
ID No. 2566, Seq. ID No. 2574, Seq. ID No. 2576, Seq. ID No. 2578, Seq. ID No.  
10 2580, Seq. ID No. 2582, Seq. ID No. 2588, Seq. ID No. 2590, Seq. ID No. 2592,  
Seq. ID No. 2594, Seq. ID No. 2596, Seq. ID No. 2600, Seq. ID No. 2604, Seq.  
ID No. 2606, Seq. ID No. 2608, Seq. ID No. 2610, Seq. ID No. 2612, Seq. ID No.  
2614, Seq. ID No. 2618, Seq. ID No. 2620, Seq. ID No. 2624, Seq. ID No. 2626,  
Seq. ID No. 2628, Seq. ID No. 2630, Seq. ID No. 2632, Seq. ID No. 2634, Seq.  
15 ID No. 2636, Seq. ID No. 2638, Seq. ID No. 2640, Seq. ID No. 2642, Seq. ID No.  
2644, Seq. ID No. 2646, Seq. ID No. 2648, Seq. ID No. 2650, Seq. ID No. 2652,  
Seq. ID No. 2654, Seq. ID No. 2656, Seq. ID No. 2660, Seq. ID No. 2664, Seq.  
ID No. 2668, Seq. ID No. 2670, Seq. ID No. 2672, Seq. ID No. 2676, Seq. ID No.  
2678, Seq. ID No. 2684, Seq. ID No. 2686, Seq. ID No. 2688, Seq. ID No. 2690,  
20 Seq. ID No. 2692, Seq. ID No. 2694, Seq. ID No. 2696, Seq. ID No. 2698, Seq.  
ID No. 2700, Seq. ID No. 2704, Seq. ID No. 2710, Seq. ID No. 2712, Seq. ID No.  
2716, Seq. ID No. 2718, Seq. ID No. 2720, Seq. ID No. 2724, Seq. ID No. 2726,  
Seq. ID No. 2728, Seq. ID No. 2730, Seq. ID No. 2732, Seq. ID No. 2736, Seq.  
ID No. 2738, Seq. ID No. 2740, Seq. ID No. 2750, Seq. ID No. 2752, Seq. ID No.  
25 2754, Seq. ID No. 2756, Seq. ID No. 2760, Seq. ID No. 2766, Seq. ID No. 2768,  
Seq. ID No. 2770, Seq. ID No. 2772, Seq. ID No. 2774, Seq. ID No. 2776, Seq.  
ID No. 2780, Seq. ID No. 2782, Seq. ID No. 2784, Seq. ID No. 2788, Seq. ID No.  
2790, Seq. ID No. 2792, Seq. ID No. 2794, Seq. ID No. 2796, Seq. ID No. 2798,  
Seq. ID No. 2800, Seq. ID No. 2802, Seq. ID No. 2804, Seq. ID No. 2808, Seq.  
30 ID No. 2810, Seq. ID No. 2814, Seq. ID No. 2816, Seq. ID No. 2822, Seq. ID No.  
2824, Seq. ID No. 2828, Seq. ID No. 2830, Seq. ID No. 2832, Seq. ID No. 2834,  
Seq. ID No. 2840, Seq. ID No. 2842, Seq. ID No. 2844, Seq. ID No. 2846, Seq.  
ID No. 2848, Seq. ID No. 2856, Seq. ID No. 2862, Seq. ID No. 2864, Seq. ID No.  
2866, Seq. ID No. 2868, Seq. ID No. 2870, Seq. ID No. 2872, Seq. ID No. 2878,  
Seq. ID No. 2882, Seq. ID No. 2884, Seq. ID No. 2886, Seq. ID No. 2888, Seq.  
ID No. 2892, Seq. ID No. 2894, Seq. ID No. 2896, Seq. ID No. 2900, Seq. ID No.  
2902, Seq. ID No. 2908, Seq. ID No. 2916, Seq. ID No. 2918, Seq. ID No. 2920,  
Seq. ID No. 2922, Seq. ID No. 2924, Seq. ID No. 2928, Seq. ID No. 2932, Seq.

5 ID No. 2934, Seq. ID No. 2936, Seq. ID No. 2944, Seq. ID No. 2946, Seq. ID No.  
2952, Seq. ID No. 2954, Seq. ID No. 2958, Seq. ID No. 2960, Seq. ID No. 2962,  
Seq. ID No. 2964, Seq. ID No. 2966, Seq. ID No. 2968, Seq. ID No. 2972, Seq.  
ID No. 2974, Seq. ID No. 2976, Seq. ID No. 2978, Seq. ID No. 2980, Seq. ID No.  
10 2984, Seq. ID No. 2986, Seq. ID No. 2988, Seq. ID No. 2992, Seq. ID No. 2994,  
Seq. ID No. 3000, Seq. ID No. 3002, Seq. ID No. 3006, Seq. ID No. 3010, Seq.  
ID No. 3012, Seq. ID No. 3016, Seq. ID No. 3018, Seq. ID No. 3020, Seq. ID No.  
3022, Seq. ID No. 3028, Seq. ID No. 3034, Seq. ID No. 3036, Seq. ID No. 3038,  
Seq. ID No. 3040, Seq. ID No. 3044, Seq. ID No. 3046, Seq. ID No. 3048, Seq.  
15 ID No. 3050, Seq. ID No. 3052, Seq. ID No. 3054, Seq. ID No. 3056, Seq. ID No.  
3058, Seq. ID No. 3060, Seq. ID No. 3068, Seq. ID No. 3070, Seq. ID No. 3072,  
Seq. ID No. 3080, Seq. ID No. 3084, Seq. ID No. 3086, Seq. ID No. 3088, Seq.  
ID No. 3092, Seq. ID No. 3094, Seq. ID No. 3100, Seq. ID No. 3102, Seq. ID No.  
3104, Seq. ID No. 3110, Seq. ID No. 3112, Seq. ID No. 3116, Seq. ID No. 3118,  
20 Seq. ID No. 3120, Seq. ID No. 3122, Seq. ID No. 3124, Seq. ID No. 3126, Seq.  
ID No. 3130, Seq. ID No. 3132, Seq. ID No. 3134, Seq. ID No. 3136, Seq. ID No.  
3138, Seq. ID No. 3140, Seq. ID No. 3142, Seq. ID No. 3144, Seq. ID No. 3148,  
Seq. ID No. 3150, Seq. ID No. 3152, Seq. ID No. 3154, Seq. ID No. 3156, Seq.  
ID No. 3158, Seq. ID No. 3160, Seq. ID No. 3162, Seq. ID No. 3166, Seq. ID No.  
25 3168, Seq. ID No. 3170, Seq. ID No. 3172, Seq. ID No. 3174, Seq. ID No. 3180,  
Seq. ID No. 3182, Seq. ID No. 3184, Seq. ID No. 3186, Seq. ID No. 3188, Seq.  
ID No. 3190, Seq. ID No. 3192, Seq. ID No. 3194, Seq. ID No. 3196, Seq. ID No.  
3198, Seq. ID No. 3204, Seq. ID No. 3206, Seq. ID No. 3208, Seq. ID No. 3210,  
Seq. ID No. 3212, Seq. ID No. 3218, Seq. ID No. 3224, Seq. ID No. 3226, Seq.  
30 ID No. 3228, Seq. ID No. 3230, Seq. ID No. 3236, Seq. ID No. 3250, Seq. ID No.  
3252, Seq. ID No. 3254, Seq. ID No. 3256, Seq. ID No. 3258, Seq. ID No. 3260,  
Seq. ID No. 3264, Seq. ID No. 3266, Seq. ID No. 3270, Seq. ID No. 3272, Seq.  
ID No. 3274, Seq. ID No. 3278, Seq. ID No. 3282, Seq. ID No. 3284, Seq. ID No.  
3286, Seq. ID No. 3290, Seq. ID No. 3292, Seq. ID No. 3294, Seq. ID No. 3300,  
Seq. ID No. 3302, Seq. ID No. 3304, Seq. ID No. 3306, Seq. ID No. 3308, Seq.  
ID No. 3310, Seq. ID No. 3312, Seq. ID No. 3314, Seq. ID No. 3316, Seq. ID No.  
3320, Seq. ID No. 3322, Seq. ID No. 3324, Seq. ID No. 3326, Seq. ID No. 3332,  
Seq. ID No. 3336, Seq. ID No. 3338, Seq. ID No. 3340, Seq. ID No. 3342, Seq.

5 ID No. 3346, Seq. ID No. 3348, Seq. ID No. 3350, Seq. ID No. 3354, Seq. ID No.  
3356, Seq. ID No. 3360, Seq. ID No. 3362, Seq. ID No. 3364, Seq. ID No. 3366,  
Seq. ID No. 3368, Seq. ID No. 3370, Seq. ID No. 3372, Seq. ID No. 3374, Seq.  
ID No. 3376, Seq. ID No. 3378, Seq. ID No. 3380, Seq. ID No. 3382, Seq. ID No.  
3384, Seq. ID No. 3398, Seq. ID No. 3400, Seq. ID No. 3402, Seq. ID No. 3408,  
Seq. ID No. 3410, Seq. ID No. 3414, Seq. ID No. 3416, Seq. ID No. 3420, Seq.  
ID No. 3426, Seq. ID No. 3428, Seq. ID No. 3432, Seq. ID No. 3434, Seq. ID No.  
3436, Seq. ID No. 3440, Seq. ID No. 3442, Seq. ID No. 3444, Seq. ID No. 3446,  
Seq. ID No. 3448, Seq. ID No. 3456, Seq. ID No. 3458, Seq. ID No. 3460, Seq.  
10 ID No. 3462, Seq. ID No. 3466, Seq. ID No. 3468, Seq. ID No. 3472, Seq. ID No.  
3474, Seq. ID No. 3476, Seq. ID No. 3480, Seq. ID No. 3484, Seq. ID No. 3486,  
Seq. ID No. 3488, Seq. ID No. 3490, Seq. ID No. 3496, Seq. ID No. 3498, Seq.  
ID No. 3500, Seq. ID No. 3502, Seq. ID No. 3506, Seq. ID No. 3508, Seq. ID No.  
3510, Seq. ID No. 3512, Seq. ID No. 3514, Seq. ID No. 3518, Seq. ID No. 3520,  
15 Seq. ID No. 3522, Seq. ID No. 3526, Seq. ID No. 3530, Seq. ID No. 3532, Seq.  
ID No. 3534, Seq. ID No. 3536, Seq. ID No. 3538, Seq. ID No. 3540, Seq. ID No.  
3542, Seq. ID No. 3544, Seq. ID No. 3546, Seq. ID No. 3548, Seq. ID No. 3550,  
Seq. ID No. 3552, Seq. ID No. 3554, Seq. ID No. 3556, Seq. ID No. 3558, Seq.  
ID No. 3560, Seq. ID No. 3562, Seq. ID No. 3564, Seq. ID No. 3566, Seq. ID No.  
20 3568, Seq. ID No. 3570, Seq. ID No. 3572, Seq. ID No. 3574, Seq. ID No. 3576,  
Seq. ID No. 3580, Seq. ID No. 3582, Seq. ID No. 3584, Seq. ID No. 3588, Seq.  
ID No. 3590, Seq. ID No. 3596, Seq. ID No. 3598, Seq. ID No. 3600, Seq. ID No.  
3604, Seq. ID No. 3606, Seq. ID No. 3608, Seq. ID No. 3610, Seq. ID No. 3612,  
Seq. ID No. 3614, Seq. ID No. 3616, Seq. ID No. 3618, Seq. ID No. 3620, Seq.  
25 ID No. 3622, Seq. ID No. 3624, Seq. ID No. 3628, Seq. ID No. 3630, Seq. ID No.  
3636, Seq. ID No. 3638, Seq. ID No. 3640, Seq. ID No. 3642, Seq. ID No. 3646,  
Seq. ID No. 3648, Seq. ID No. 3650, Seq. ID No. 3652, Seq. ID No. 3654, Seq.  
ID No. 3658, Seq. ID No. 3660, Seq. ID No. 3664, Seq. ID No. 3666, Seq. ID No.  
3668, Seq. ID No. 3672, Seq. ID No. 3674, Seq. ID No. 3676, Seq. ID No. 3678,  
30 Seq. ID No. 3680, Seq. ID No. 3682, Seq. ID No. 3684, Seq. ID No. 3686, Seq.  
ID No. 3688, Seq. ID No. 3690, Seq. ID No. 3692, Seq. ID No. 3694, Seq. ID No.  
3696, Seq. ID No. 3700, Seq. ID No. 3702, Seq. ID No. 3704, Seq. ID No. 3706,  
Seq. ID No. 3708, Seq. ID No. 3710, Seq. ID No. 3714, Seq. ID No. 3716, Seq.

5 ID No. 3718, Seq. ID No. 3728, Seq. ID No. 3730, Seq. ID No. 3734, Seq. ID No.  
3738, Seq. ID No. 3740, Seq. ID No. 3742, Seq. ID No. 3746, Seq. ID No. 3748,  
Seq. ID No. 3760, Seq. ID No. 3768, Seq. ID No. 3770, Seq. ID No. 3772, Seq.  
ID No. 3780, Seq. ID No. 3784, Seq. ID No. 3786, Seq. ID No. 3790, Seq. ID No.  
3792, Seq. ID No. 3796, Seq. ID No. 3798, Seq. ID No. 3804, Seq. ID No. 3806,  
Seq. ID No. 3808, Seq. ID No. 3810, Seq. ID No. 3812, Seq. ID No. 3814, Seq.  
ID No. 3816, Seq. ID No. 3818, Seq. ID No. 3820, Seq. ID No. 3824, Seq. ID No.  
3826, Seq. ID No. 3832, Seq. ID No. 3834, Seq. ID No. 3836, Seq. ID No. 3842,  
Seq. ID No. 3844, Seq. ID No. 3848, Seq. ID No. 3856, Seq. ID No. 3858, Seq.  
10 ID No. 3864, Seq. ID No. 3868, Seq. ID No. 3872, Seq. ID No. 3874, Seq. ID No.  
3876, Seq. ID No. 3878, Seq. ID No. 3882, Seq. ID No. 3884, Seq. ID No. 3886,  
Seq. ID No. 3894, Seq. ID No. 3896, Seq. ID No. 3900, Seq. ID No. 3902, Seq.  
ID No. 3906, Seq. ID No. 3908, Seq. ID No. 3912, Seq. ID No. 3914, Seq. ID No.  
3916, Seq. ID No. 3920, Seq. ID No. 3922, Seq. ID No. 3924, Seq. ID No. 3926,  
15 Seq. ID No. 3928, Seq. ID No. 3930, Seq. ID No. 3932, Seq. ID No. 3934, Seq.  
ID No. 3936, Seq. ID No. 3940, Seq. ID No. 3942, Seq. ID No. 3944, Seq. ID No.  
3946, Seq. ID No. 3948, Seq. ID No. 3950, Seq. ID No. 3952, Seq. ID No. 3954,  
Seq. ID No. 3956, Seq. ID No. 3958, Seq. ID No. 3960, Seq. ID No. 3962, Seq.  
ID No. 3966, Seq. ID No. 3968, Seq. ID No. 3970, Seq. ID No. 3972, Seq. ID No.  
20 3976, Seq. ID No. 3980, Seq. ID No. 3982, Seq. ID No. 3984, Seq. ID No. 3986,  
Seq. ID No. 3988, Seq. ID No. 3992, Seq. ID No. 3996, Seq. ID No. 3998, Seq.  
ID No. 4000, Seq. ID No. 4004, Seq. ID No. 4008, Seq. ID No. 4010, Seq. ID No.  
4016, Seq. ID No. 4018, Seq. ID No. 4022, Seq. ID No. 4024, Seq. ID No. 4030,  
Seq. ID No. 4036, Seq. ID No. 4038, Seq. ID No. 4040, Seq. ID No. 4050, Seq.  
25 ID No. 4052, Seq. ID No. 4054, Seq. ID No. 4056, Seq. ID No. 4058, Seq. ID No.  
4062, Seq. ID No. 4076, Seq. ID No. 4080, Seq. ID No. 4086, Seq. ID No. 4088,  
Seq. ID No. 4090, Seq. ID No. 4092, Seq. ID No. 4094, Seq. ID No. 4096, Seq.  
ID No. 4100, Seq. ID No. 4106, Seq. ID No. 4108, Seq. ID No. 4110, Seq. ID No.  
4112, Seq. ID No. 4114, Seq. ID No. 4118, Seq. ID No. 4120, Seq. ID No. 4122,  
30 Seq. ID No. 4124, Seq. ID No. 4126, Seq. ID No. 4128, Seq. ID No. 4130, Seq.  
ID No. 4132, Seq. ID No. 4134, Seq. ID No. 4136, Seq. ID No. 4138, Seq. ID No.  
4140, Seq. ID No. 4142, Seq. ID No. 4144, Seq. ID No. 4146, Seq. ID No. 4150,  
Seq. ID No. 4154, Seq. ID No. 4156, Seq. ID No. 4158, Seq. ID No. 4162, Seq.

5 ID No. 4164, Seq. ID No. 4168, Seq. ID No. 4172, Seq. ID No. 4174, Seq. ID No.  
4176, Seq. ID No. 4178, Seq. ID No. 4180, Seq. ID No. 4182, Seq. ID No. 4186,  
Seq. ID No. 4188, Seq. ID No. 4190, Seq. ID No. 4192, Seq. ID No. 4194, Seq.  
ID No. 4196, Seq. ID No. 4198, Seq. ID No. 4200, Seq. ID No. 4204, Seq. ID No.  
10 4206, Seq. ID No. 4208, Seq. ID No. 4210, Seq. ID No. 4212, Seq. ID No. 4220,  
Seq. ID No. 4230, Seq. ID No. 4234, Seq. ID No. 4236, Seq. ID No. 4238, Seq.  
ID No. 4240, Seq. ID No. 4244, Seq. ID No. 4250, Seq. ID No. 4252, Seq. ID No.  
4254, Seq. ID No. 4256, Seq. ID No. 4260, Seq. ID No. 4264, Seq. ID No. 4266,  
Seq. ID No. 4268, Seq. ID No. 4270, Seq. ID No. 4272, Seq. ID No. 4274, Seq.  
10 ID No. 4276, Seq. ID No. 4282, Seq. ID No. 4284, Seq. ID No. 4286, Seq. ID No.  
4288, Seq. ID No. 4290, Seq. ID No. 4292, Seq. ID No. 4294, Seq. ID No. 4296,  
Seq. ID No. 4298, Seq. ID No. 4300, Seq. ID No. 4302, Seq. ID No. 4304, Seq.  
ID No. 4308, Seq. ID No. 4310, Seq. ID No. 4314, Seq. ID No. 4316, Seq. ID No.  
15 4318, Seq. ID No. 4320, Seq. ID No. 4322, Seq. ID No. 4324, Seq. ID No. 4326,  
Seq. ID No. 4330, Seq. ID No. 4332, Seq. ID No. 4334, Seq. ID No. 4336, Seq.  
ID No. 4338, Seq. ID No. 4340, Seq. ID No. 4344, Seq. ID No. 4346, Seq. ID No.  
4348, Seq. ID No. 4352, Seq. ID No. 4354, Seq. ID No. 4356, Seq. ID No. 4360,  
Seq. ID No. 4362, Seq. ID No. 4364, Seq. ID No. 4366, Seq. ID No. 4368, Seq.  
ID No. 4370, Seq. ID No. 4376, Seq. ID No. 4378, Seq. ID No. 4380, Seq. ID No.  
20 4384, Seq. ID No. 4390, Seq. ID No. 4392, Seq. ID No. 4394, Seq. ID No. 4396,  
Seq. ID No. 4398, Seq. ID No. 4400, Seq. ID No. 4402, Seq. ID No. 4404, Seq.  
ID No. 4406, Seq. ID No. 4408, Seq. ID No. 4410, Seq. ID No. 4412, Seq. ID No.  
4414, Seq. ID No. 4416, Seq. ID No. 4418, Seq. ID No. 4420, Seq. ID No. 4422,  
Seq. ID No. 4424, Seq. ID No. 4426, Seq. ID No. 4428, Seq. ID No. 4430, Seq.  
25 ID No. 4432, Seq. ID No. 4436, Seq. ID No. 4438, Seq. ID No. 4440, Seq. ID No.  
4442, Seq. ID No. 4450, Seq. ID No. 4452, Seq. ID No. 4454, Seq. ID No. 4456,  
Seq. ID No. 4458, Seq. ID No. 4460, Seq. ID No. 4462, Seq. ID No. 4466, Seq.  
ID No. 4468, Seq. ID No. 4472, Seq. ID No. 4476, Seq. ID No. 4478, Seq. ID No.  
4480, Seq. ID No. 4482, Seq. ID No. 4486, Seq. ID No. 4488, Seq. ID No. 4490,  
30 Seq. ID No. 4492, Seq. ID No. 4494, Seq. ID No. 4496, Seq. ID No. 4498, Seq.  
ID No. 4502, Seq. ID No. 4504, Seq. ID No. 4506, Seq. ID No. 4508, Seq. ID No.  
4510, Seq. ID No. 4512, Seq. ID No. 4514, Seq. ID No. 4516, Seq. ID No. 4520,  
Seq. ID No. 4522, Seq. ID No. 4524, Seq. ID No. 4526, Seq. ID No. 4528, Seq.

5 ID No. 4530, Seq. ID No. 4532, Seq. ID No. 4534, Seq. ID No. 4538, Seq. ID No.  
4542, Seq. ID No. 4546, Seq. ID No. 4548, Seq. ID No. 4550, Seq. ID No. 4552,  
Seq. ID No. 4554, Seq. ID No. 4556, Seq. ID No. 4560, Seq. ID No. 4562, Seq.  
ID No. 4566, Seq. ID No. 4568, Seq. ID No. 4572, Seq. ID No. 4574, Seq. ID No.  
4576, Seq. ID No. 4578, Seq. ID No. 4582, Seq. ID No. 4586, Seq. ID No. 4590,  
Seq. ID No. 4592, Seq. ID No. 4598, Seq. ID No. 4600, Seq. ID No. 4602, Seq.  
ID No. 4604, Seq. ID No. 4606, Seq. ID No. 4608, Seq. ID No. 4610, Seq. ID No.  
4612, Seq. ID No. 4614, Seq. ID No. 4616, Seq. ID No. 4618, Seq. ID No. 4620,  
Seq. ID No. 4622, Seq. ID No. 4624, Seq. ID No. 4628, Seq. ID No. 4632, Seq.  
10 ID No. 4638, Seq. ID No. 4642, Seq. ID No. 4644, Seq. ID No. 4646, Seq. ID No.  
4648, Seq. ID No. 4650, Seq. ID No. 4654, Seq. ID No. 4660, Seq. ID No. 4662,  
Seq. ID No. 4664, Seq. ID No. 4666, Seq. ID No. 4668, Seq. ID No. 4670, Seq.  
ID No. 4672, Seq. ID No. 4674, Seq. ID No. 4676, Seq. ID No. 4678, Seq. ID No.  
4680, Seq. ID No. 4684, Seq. ID No. 4686, Seq. ID No. 4688, Seq. ID No. 4692,  
Seq. ID No. 4694, Seq. ID No. 4696, Seq. ID No. 4700, Seq. ID No. 4702, Seq.  
15 ID No. 4704, Seq. ID No. 4706, Seq. ID No. 4714, Seq. ID No. 4718, Seq. ID No.  
4720, Seq. ID No. 4722, Seq. ID No. 4728, Seq. ID No. 4730, Seq. ID No. 4734,  
Seq. ID No. 4736, Seq. ID No. 4738, Seq. ID No. 4740, Seq. ID No. 4742, Seq.  
ID No. 4744, Seq. ID No. 4748, Seq. ID No. 4750, Seq. ID No. 4752, Seq. ID No.  
20 4756, Seq. ID No. 4758, Seq. ID No. 4764, Seq. ID No. 4766, Seq. ID No. 4768,  
Seq. ID No. 4770, Seq. ID No. 4774, Seq. ID No. 4776, Seq. ID No. 4778, Seq.  
ID No. 4780, Seq. ID No. 4782, Seq. ID No. 4788, Seq. ID No. 4790, Seq. ID No.  
4792, Seq. ID No. 4794, Seq. ID No. 4796, Seq. ID No. 4798, Seq. ID No. 4802,  
Seq. ID No. 4804, Seq. ID No. 4806, Seq. ID No. 4810, Seq. ID No. 4812, Seq.  
25 ID No. 4814, Seq. ID No. 4816, Seq. ID No. 4818, Seq. ID No. 4820, Seq. ID No.  
4826, Seq. ID No. 4828, Seq. ID No. 4830, Seq. ID No. 4832, Seq. ID No. 4834,  
Seq. ID No. 4838, Seq. ID No. 4840, Seq. ID No. 4842, Seq. ID No. 4844, Seq.  
ID No. 4846, Seq. ID No. 4850, Seq. ID No. 4852, Seq. ID No. 4854, Seq. ID No.  
4856, Seq. ID No. 4862, Seq. ID No. 4864, Seq. ID No. 4868, Seq. ID No. 4876,  
30 Seq. ID No. 4878, Seq. ID No. 4880, Seq. ID No. 4882, Seq. ID No. 4884, Seq.  
ID No. 4890, Seq. ID No. 4892, Seq. ID No. 4894, Seq. ID No. 4896, Seq. ID No.  
4898, Seq. ID No. 4900, Seq. ID No. 4902, Seq. ID No. 4904, Seq. ID No. 4906,  
Seq. ID No. 4908, Seq. ID No. 4910, Seq. ID No. 4912, Seq. ID No. 4914, Seq.

5 ID No. 4916, Seq. ID No. 4918, Seq. ID No. 4920, Seq. ID No. 4922, Seq. ID No.  
4924, Seq. ID No. 4928, Seq. ID No. 4932, Seq. ID No. 4936, Seq. ID No. 4938,  
Seq. ID No. 4940, Seq. ID No. 4942, Seq. ID No. 4944, Seq. ID No. 4946, Seq.  
ID No. 4948, Seq. ID No. 4950, Seq. ID No. 4952, Seq. ID No. 4954, Seq. ID No.  
10 4958, Seq. ID No. 4960, Seq. ID No. 4962, Seq. ID No. 4964, Seq. ID No. 4974,  
Seq. ID No. 4976, Seq. ID No. 4978, Seq. ID No. 4980, Seq. ID No. 4982, Seq.  
ID No. 4984, Seq. ID No. 4986, Seq. ID No. 4988, Seq. ID No. 4990, Seq. ID No.  
4992, Seq. ID No. 4994, Seq. ID No. 4996, Seq. ID No. 4998, Seq. ID No. 5000,  
Seq. ID No. 5004, Seq. ID No. 5006, Seq. ID No. 5008, Seq. ID No. 5010, Seq.  
10 ID No. 5012, Seq. ID No. 5014, Seq. ID No. 5018, Seq. ID No. 5020, Seq. ID No.  
5022, Seq. ID No. 5024, Seq. ID No. 5026, Seq. ID No. 5030, Seq. ID No. 5032,  
Seq. ID No. 5034, Seq. ID No. 5036, Seq. ID No. 5042, Seq. ID No. 5044, Seq.  
ID No. 5046, Seq. ID No. 5048, Seq. ID No. 5058, Seq. ID No. 5060, Seq. ID No.  
15 5064, Seq. ID No. 5066, Seq. ID No. 5068, Seq. ID No. 5070, Seq. ID No. 5076,  
Seq. ID No. 5078, Seq. ID No. 5080, Seq. ID No. 5082, Seq. ID No. 5084, Seq.  
ID No. 5086, Seq. ID No. 5088, Seq. ID No. 5092, Seq. ID No. 5100, Seq. ID No.  
5102, Seq. ID No. 5104, Seq. ID No. 5110, Seq. ID No. 5112, Seq. ID No. 5114,  
Seq. ID No. 5116, Seq. ID No. 5118, Seq. ID No. 5122, Seq. ID No. 5126, Seq.  
ID No. 5128, Seq. ID No. 5134, Seq. ID No. 5140, Seq. ID No. 5142, Seq. ID No.  
20 5146, Seq. ID No. 5148, Seq. ID No. 5150, Seq. ID No. 5152, Seq. ID No. 5156,  
Seq. ID No. 5158, Seq. ID No. 5160, Seq. ID No. 5162, Seq. ID No. 5166, Seq.  
ID No. 5168, Seq. ID No. 5170, Seq. ID No. 5178, Seq. ID No. 5182, Seq. ID No.  
5184, Seq. ID No. 5186, Seq. ID No. 5188, Seq. ID No. 5190, Seq. ID No. 5192,  
Seq. ID No. 5194, Seq. ID No. 5196, Seq. ID No. 5198, Seq. ID No. 5200, Seq.  
25 ID No. 5202, Seq. ID No. 5204, Seq. ID No. 5206, Seq. ID No. 5210, Seq. ID No.  
5212, Seq. ID No. 5216, Seq. ID No. 5220, Seq. ID No. 5222, Seq. ID No. 5230,  
Seq. ID No. 5232, Seq. ID No. 5240, Seq. ID No. 5242, Seq. ID No. 5244, Seq.  
ID No. 5246, Seq. ID No. 5252, Seq. ID No. 5254, Seq. ID No. 5256, Seq. ID No.  
5262, Seq. ID No. 5264, Seq. ID No. 5266, Seq. ID No. 5268, Seq. ID No. 5278,  
30 Seq. ID No. 5280, Seq. ID No. 5282, Seq. ID No. 5286, Seq. ID No. 5288, Seq.  
ID No. 5292, Seq. ID No. 5296, Seq. ID No. 5298, Seq. ID No. 5300, Seq. ID No.  
5302, Seq. ID No. 5304, Seq. ID No. 5306, Seq. ID No. 5308, Seq. ID No. 5310,  
Seq. ID No. 5312, Seq. ID No. 5314, Seq. ID No. 5318, Seq. ID No. 5320, Seq.



5 ID No. 5322, Seq. ID No. 5324, Seq. ID No. 5328, Seq. ID No. 5330, Seq. ID No.  
5332, Seq. ID No. 5334, Seq. ID No. 5336, Seq. ID No. 5338, Seq. ID No. 5344,  
Seq. ID No. 5346, Seq. ID No. 5350, Seq. ID No. 5352, Seq. ID No. 5358, Seq.  
ID No. 5360, Seq. ID No. 5366, Seq. ID No. 5368, Seq. ID No. 5374, Seq. ID No.  
5378, Seq. ID No. 5380, Seq. ID No. 5382, Seq. ID No. 5384, Seq. ID No. 5388,  
Seq. ID No. 5390, Seq. ID No. 5392, Seq. ID No. 5394, Seq. ID No. 5398, Seq.  
ID No. 5400, Seq. ID No. 5402, Seq. ID No. 5404, Seq. ID No. 5406, Seq. ID No.  
5408, Seq. ID No. 5410, Seq. ID No. 5412, Seq. ID No. 5416, Seq. ID No. 5418,  
Seq. ID No. 5420, Seq. ID No. 5422, Seq. ID No. 5424, Seq. ID No. 5426, Seq.  
10 ID No. 5428, Seq. ID No. 5432, Seq. ID No. 5434, Seq. ID No. 5436, Seq. ID No.  
5438, Seq. ID No. 5440, Seq. ID No. 5442, Seq. ID No. 5444, Seq. ID No. 5448,  
Seq. ID No. 5450, Seq. ID No. 5452, Seq. ID No. 5454, Seq. ID No. 5456, Seq.  
ID No. 5458, Seq. ID No. 5468, Seq. ID No. 5472, Seq. ID No. 5474, Seq. ID No.  
5478, Seq. ID No. 5480, Seq. ID No. 5482, Seq. ID No. 5492, Seq. ID No. 5494,  
15 Seq. ID No. 5496, Seq. ID No. 5500, Seq. ID No. 5504, Seq. ID No. 5510, Seq.  
ID No. 5514, Seq. ID No. 5516, Seq. ID No. 5518, Seq. ID No. 5520, Seq. ID No.  
5522, Seq. ID No. 5528, Seq. ID No. 5530, Seq. ID No. 5532, Seq. ID No. 5534,  
Seq. ID No. 5538, Seq. ID No. 5540, Seq. ID No. 5542, Seq. ID No. 5544, Seq.  
ID No. 5546, Seq. ID No. 5548, Seq. ID No. 5550, Seq. ID No. 5552, Seq. ID No.  
20 5554, Seq. ID No. 5558, Seq. ID No. 5560, Seq. ID No. 5564, Seq. ID No. 5568,  
Seq. ID No. 5570, Seq. ID No. 5576, Seq. ID No. 5578, Seq. ID No. 5582, Seq.  
ID No. 5584, Seq. ID No. 5586, Seq. ID No. 5590, Seq. ID No. 5592, Seq. ID No.  
5594, Seq. ID No. 5596, Seq. ID No. 5600, Seq. ID No. 5602, Seq. ID No. 5608,  
Seq. ID No. 5614, Seq. ID No. 5616, Seq. ID No. 5618, Seq. ID No. 5620, Seq.  
25 ID No. 5622, Seq. ID No. 5626, Seq. ID No. 5628, Seq. ID No. 5630, Seq. ID No.  
5632, Seq. ID No. 5638, Seq. ID No. 5640, Seq. ID No. 5642, Seq. ID No. 5646,  
Seq. ID No. 5648, Seq. ID No. 5650, Seq. ID No. 5652, Seq. ID No. 5656, Seq.  
ID No. 5658, Seq. ID No. 5662, Seq. ID No. 5666, Seq. ID No. 5668, Seq. ID No.  
5670, Seq. ID No. 5678, Seq. ID No. 5680, Seq. ID No. 5684, Seq. ID No. 5686,  
30 Seq. ID No. 5688, Seq. ID No. 5690, Seq. ID No. 5692, Seq. ID No. 5694, Seq.  
ID No. 5698, Seq. ID No. 5700, Seq. ID No. 5702, Seq. ID No. 5704, Seq. ID No.  
5706, Seq. ID No. 5708, Seq. ID No. 5712, Seq. ID No. 5714, Seq. ID No. 5716,  
Seq. ID No. 5718, Seq. ID No. 5720, Seq. ID No. 5722, Seq. ID No. 5724, Seq.

5 ID No. 5726, Seq. ID No. 5728, Seq. ID No. 5736, Seq. ID No. 5740, Seq. ID No.  
5742, Seq. ID No. 5744, Seq. ID No. 5746, Seq. ID No. 5748, Seq. ID No. 5750,  
Seq. ID No. 5752, Seq. ID No. 5754, Seq. ID No. 5756, Seq. ID No. 5758, Seq.  
ID No. 5760, Seq. ID No. 5762, Seq. ID No. 5770, Seq. ID No. 5772, Seq. ID No.  
5778, Seq. ID No. 5780, Seq. ID No. 5784, Seq. ID No. 5788, Seq. ID No. 5792,  
Seq. ID No. 5796, Seq. ID No. 5800, Seq. ID No. 5802, Seq. ID No. 5808, Seq.  
ID No. 5810, Seq. ID No. 5814, Seq. ID No. 5816, Seq. ID No. 5820, Seq. ID No.  
5822, Seq. ID No. 5824, Seq. ID No. 5826, Seq. ID No. 5828, Seq. ID No. 5830,  
Seq. ID No. 5832, Seq. ID No. 5834, Seq. ID No. 5836, Seq. ID No. 5838, Seq.  
10 ID No. 5840, Seq. ID No. 5842, Seq. ID No. 5846, Seq. ID No. 5848, Seq. ID No.  
5850, Seq. ID No. 5852, Seq. ID No. 5856, Seq. ID No. 5858, Seq. ID No. 5860,  
Seq. ID No. 5862, Seq. ID No. 5864, Seq. ID No. 5866, Seq. ID No. 5870, Seq.  
ID No. 5872, Seq. ID No. 5874, Seq. ID No. 5876, Seq. ID No. 5880, Seq. ID No.  
5882, Seq. ID No. 5884, Seq. ID No. 5890, Seq. ID No. 5896, Seq. ID No. 5898,  
15 Seq. ID No. 5902, Seq. ID No. 5904, Seq. ID No. 5912, Seq. ID No. 5914, Seq.  
ID No. 5916, Seq. ID No. 5918, Seq. ID No. 5920, Seq. ID No. 5928, Seq. ID No.  
5930, Seq. ID No. 5934, Seq. ID No. 5936, Seq. ID No. 5938, Seq. ID No. 5942,  
Seq. ID No. 5946, Seq. ID No. 5948, Seq. ID No. 5952, Seq. ID No. 5960, Seq.  
ID No. 5962, Seq. ID No. 5964, Seq. ID No. 5966, Seq. ID No. 5968, Seq. ID No.  
20 5970, Seq. ID No. 5972, Seq. ID No. 5974, Seq. ID No. 5978, Seq. ID No. 5980,  
Seq. ID No. 5982, Seq. ID No. 5986, Seq. ID No. 5988, Seq. ID No. 5990, Seq.  
ID No. 5992, Seq. ID No. 5994, Seq. ID No. 5996, Seq. ID No. 6000, Seq. ID No.  
6002, Seq. ID No. 6004, Seq. ID No. 6010, Seq. ID No. 6012, Seq. ID No. 6014,  
Seq. ID No. 6016, Seq. ID No. 6018, Seq. ID No. 6026, Seq. ID No. 6028, Seq.  
25 ID No. 6030, Seq. ID No. 6032, Seq. ID No. 6034, Seq. ID No. 6036, Seq. ID No.  
6040, Seq. ID No. 6042, Seq. ID No. 6044, Seq. ID No. 6046, Seq. ID No. 6050,  
Seq. ID No. 6052, Seq. ID No. 6054, Seq. ID No. 6056, Seq. ID No. 6058, Seq.  
ID No. 6062, Seq. ID No. 6064, Seq. ID No. 6066, Seq. ID No. 6070, Seq. ID No.  
6072, Seq. ID No. 6074, Seq. ID No. 6078, Seq. ID No. 6080, Seq. ID No. 6086,  
30 Seq. ID No. 6088, Seq. ID No. 6090, Seq. ID No. 6094, Seq. ID No. 6096, Seq.  
ID No. 6102, Seq. ID No. 6104, Seq. ID No. 6110, Seq. ID No. 6112, Seq. ID No.  
6118, Seq. ID No. 6122, Seq. ID No. 6124, Seq. ID No. 6130, Seq. ID No. 6132,  
Seq. ID No. 6134, Seq. ID No. 6136, Seq. ID No. 6138, Seq. ID No. 6140, Seq.

5 ID No. 6142, Seq. ID No. 6146, Seq. ID No. 6152, Seq. ID No. 6156, Seq. ID No.  
6158, Seq. ID No. 6160, Seq. ID No. 6166, Seq. ID No. 6168, Seq. ID No. 6170,  
Seq. ID No. 6172, Seq. ID No. 6176, Seq. ID No. 6178, Seq. ID No. 6182, Seq.  
ID No. 6188, Seq. ID No. 6194, Seq. ID No. 6196, Seq. ID No. 6198, Seq. ID No.  
10 6200, Seq. ID No. 6202, Seq. ID No. 6210, Seq. ID No. 6214, Seq. ID No. 6216,  
Seq. ID No. 6218, Seq. ID No. 6220, Seq. ID No. 6232, Seq. ID No. 6234, Seq.  
ID No. 6236, Seq. ID No. 6240, Seq. ID No. 6242, Seq. ID No. 6244, Seq. ID No.  
6250, Seq. ID No. 6258, Seq. ID No. 6260, Seq. ID No. 6262, Seq. ID No. 6264,  
Seq. ID No. 6268, Seq. ID No. 6270, Seq. ID No. 6272, Seq. ID No. 6276, Seq.  
15 ID No. 6278, Seq. ID No. 6280, Seq. ID No. 6282, Seq. ID No. 6284, Seq. ID No.  
6286, Seq. ID No. 6288, Seq. ID No. 6294, Seq. ID No. 6296, Seq. ID No. 6298,  
Seq. ID No. 6300, Seq. ID No. 6306, Seq. ID No. 6310, Seq. ID No. 6312, Seq.  
ID No. 6316, Seq. ID No. 6318, Seq. ID No. 6320, Seq. ID No. 6322, Seq. ID No.  
6324, Seq. ID No. 6326, Seq. ID No. 6328, Seq. ID No. 6330, Seq. ID No. 6332,  
20 Seq. ID No. 6336, Seq. ID No. 6338, Seq. ID No. 6342, Seq. ID No. 6346, Seq.  
ID No. 6350, Seq. ID No. 6352, Seq. ID No. 6354, Seq. ID No. 6360, Seq. ID No.  
6362, Seq. ID No. 6368, Seq. ID No. 6370, Seq. ID No. 6372, Seq. ID No. 6374,  
Seq. ID No. 6376, Seq. ID No. 6378, Seq. ID No. 6380, Seq. ID No. 6382, Seq.  
ID No. 6386, Seq. ID No. 6390, Seq. ID No. 6394, Seq. ID No. 6396, Seq. ID No.  
25 6400, Seq. ID No. 6410, Seq. ID No. 6412, Seq. ID No. 6414, Seq. ID No. 6418,  
Seq. ID No. 6422, Seq. ID No. 6424, Seq. ID No. 6426, Seq. ID No. 6428, Seq.  
ID No. 6430, Seq. ID No. 6432, Seq. ID No. 6442, Seq. ID No. 6444, Seq. ID No.  
6446, Seq. ID No. 6452, Seq. ID No. 6454, Seq. ID No. 6460, Seq. ID No. 6462,  
Seq. ID No. 6464, Seq. ID No. 6466, Seq. ID No. 6468, Seq. ID No. 6470, Seq.  
30 ID No. 6472, Seq. ID No. 6474, Seq. ID No. 6480, Seq. ID No. 6484, Seq. ID No.  
6494, Seq. ID No. 6496, Seq. ID No. 6498, Seq. ID No. 6502, Seq. ID No. 6504,  
Seq. ID No. 6506, Seq. ID No. 6508, Seq. ID No. 6512, Seq. ID No. 6518, Seq.  
ID No. 6524, Seq. ID No. 6526, Seq. ID No. 6536, Seq. ID No. 6538, Seq. ID No.  
6540, Seq. ID No. 6542, Seq. ID No. 6544, Seq. ID No. 6546, Seq. ID No. 6548,  
Seq. ID No. 6550, Seq. ID No. 6552, Seq. ID No. 6554, Seq. ID No. 6556, Seq.  
ID No. 6558, Seq. ID No. 6560, Seq. ID No. 6564, Seq. ID No. 6574, Seq. ID No.  
6576, Seq. ID No. 6578, Seq. ID No. 6580, Seq. ID No. 6584, Seq. ID No. 6586,  
Seq. ID No. 6588, Seq. ID No. 6592, Seq. ID No. 6598, Seq. ID No. 6602, Seq.

ID No. 6604, Seq. ID No. 6606, Seq. ID No. 6610, Seq. ID No. 6612, Seq. ID No. 6614, Seq. ID No. 6616, Seq. ID No. 6618, Seq. ID No. 6620, Seq. ID No. 6622, Seq. ID No. 6624, Seq. ID No. 6628, Seq. ID No. 6630, Seq. ID No. 6632, Seq. ID No. 6634, Seq. ID No. 6638, Seq. ID No. 6640, Seq. ID No. 6644, Seq. ID No. 6646, and Seq. ID No. 6650.

5

55. The *Alloiococcus otitidis* polypeptide of claim 36, wherein the polypeptide is identified by an ORF finder program that searches for a transmembrane domain between two Stop codons and a Start codon immediately upstream of this transmembrane region, and is selected from one of Seq. ID No. 8, Seq. ID No. 10, Seq. ID No. 34, Seq. ID No. 48, Seq. ID No. 68, Seq. ID No. 86, Seq. ID No. 88, Seq. ID No. 124, Seq. ID No. 134, Seq. ID No. 142, Seq. ID No. 160, Seq. ID No. 164, Seq. ID No. 192, Seq. ID No. 210, Seq. ID No. 212, Seq. ID No. 216, Seq. ID No. 218, Seq. ID No. 226, Seq. ID No. 236, Seq. ID No. 238, Seq. ID No. 250, Seq. ID No. 252, Seq. ID No. 256, Seq. ID No. 272, Seq. ID No. 278, Seq. ID No. 286, Seq. ID No. 288, Seq. ID No. 290, Seq. ID No. 328, Seq. ID No. 330, Seq. ID No. 374, Seq. ID No. 376, Seq. ID No. 420, Seq. ID No. 488, Seq. ID No. 498, Seq. ID No. 500, Seq. ID No. 504, Seq. ID No. 506, Seq. ID No. 510, Seq. ID No. 512, Seq. ID No. 516, Seq. ID No. 526, Seq. ID No. 528, Seq. ID No. 546, Seq. ID No. 568, Seq. ID No. 570, Seq. ID No. 576, Seq. ID No. 578, Seq. ID No. 580, Seq. ID No. 594, Seq. ID No. 618, Seq. ID No. 638, Seq. ID No. 640, Seq. ID No. 642, Seq. ID No. 646, Seq. ID No. 654, Seq. ID No. 656, Seq. ID No. 660, Seq. ID No. 670, Seq. ID No. 676, Seq. ID No. 678, Seq. ID No. 680, Seq. ID No. 716, Seq. ID No. 718, Seq. ID No. 720, Seq. ID No. 722, Seq. ID No. 724, Seq. ID No. 748, Seq. ID No. 752, Seq. ID No. 756, Seq. ID No. 758, Seq. ID No. 760, Seq. ID No. 762, Seq. ID No. 764, Seq. ID No. 770, Seq. ID No. 778, Seq. ID No. 780, Seq. ID No. 808, Seq. ID No. 810, Seq. ID No. 820, Seq. ID No. 826, Seq. ID No. 864, Seq. ID No. 894, Seq. ID No. 902, Seq. ID No. 936, Seq. ID No. 944, Seq. ID No. 956, Seq. ID No. 968, Seq. ID No. 980, Seq. ID No. 1006, Seq. ID No. 1010, Seq. ID No. 1012, Seq. ID No. 1014, Seq. ID No. 1016, Seq. ID No. 1020, Seq. ID No. 1030, Seq. ID No. 1032, Seq. ID No. 1034, Seq. ID No. 1038, Seq. ID No. 1040, Seq. ID No. 1046, Seq. ID No. 1056, Seq. ID No. 1076, Seq. ID No. 1106, Seq. ID No. 1132, Seq. ID No. 1136, Seq. ID No. 1138, Seq. ID No.

10

15

20

25

30

1166, Seq. ID No. 1168, Seq. ID No. 1170, Seq. ID No. 1184, Seq. ID No. 1194,  
Seq. ID No. 1198, Seq. ID No. 1214, Seq. ID No. 1224, Seq. ID No. 1228, Seq.  
ID No. 1230, Seq. ID No. 1238, Seq. ID No. 1244, Seq. ID No. 1266, Seq. ID No.  
1268, Seq. ID No. 1270, Seq. ID No. 1272, Seq. ID No. 1284, Seq. ID No. 1288,  
5 Seq. ID No. 1292, Seq. ID No. 1298, Seq. ID No. 1306, Seq. ID No. 1316, Seq.  
ID No. 1326, Seq. ID No. 1328, Seq. ID No. 1330, Seq. ID No. 1332, Seq. ID No.  
1342, Seq. ID No. 1354, Seq. ID No. 1368, Seq. ID No. 1402, Seq. ID No. 1430,  
Seq. ID No. 1436, Seq. ID No. 1446, Seq. ID No. 1482, Seq. ID No. 1514, Seq.  
ID No. 1516, Seq. ID No. 1518, Seq. ID No. 1530, Seq. ID No. 1534, Seq. ID No.  
10 1536, Seq. ID No. 1546, Seq. ID No. 1548, Seq. ID No. 1552, Seq. ID No. 1560,  
Seq. ID No. 1564, Seq. ID No. 1572, Seq. ID No. 1580, Seq. ID No. 1584, Seq.  
ID No. 1586, Seq. ID No. 1622, Seq. ID No. 1634, Seq. ID No. 1644, Seq. ID No.  
1646, Seq. ID No. 1648, Seq. ID No. 1650, Seq. ID No. 1654, Seq. ID No. 1672,  
Seq. ID No. 1674, Seq. ID No. 1678, Seq. ID No. 1682, Seq. ID No. 1708, Seq.  
15 ID No. 1732, Seq. ID No. 1734, Seq. ID No. 1738, Seq. ID No. 1754, Seq. ID No.  
1758, Seq. ID No. 1766, Seq. ID No. 1768, Seq. ID No. 1788, Seq. ID No. 1792,  
Seq. ID No. 1798, Seq. ID No. 1806, Seq. ID No. 1820, Seq. ID No. 1822, Seq.  
ID No. 1824, Seq. ID No. 1840, Seq. ID No. 1870, Seq. ID No. 1876, Seq. ID No.  
1892, Seq. ID No. 1894, Seq. ID No. 1896, Seq. ID No. 1924, Seq. ID No. 1928,  
20 Seq. ID No. 1970, Seq. ID No. 1982, Seq. ID No. 1992, Seq. ID No. 1994, Seq.  
ID No. 2014, Seq. ID No. 2018, Seq. ID No. 2028, Seq. ID No. 2034, Seq. ID No.  
2042, Seq. ID No. 2050, Seq. ID No. 2054, Seq. ID No. 2088, Seq. ID No. 2090,  
Seq. ID No. 2106, Seq. ID No. 2116, Seq. ID No. 2122, Seq. ID No. 2128, Seq.  
ID No. 2152, Seq. ID No. 2160, Seq. ID No. 2172, Seq. ID No. 2174, Seq. ID No.  
25 2178, Seq. ID No. 2188, Seq. ID No. 2238, Seq. ID No. 2240, Seq. ID No. 2246,  
Seq. ID No. 2250, Seq. ID No. 2272, Seq. ID No. 2284, Seq. ID No. 2290, Seq.  
ID No. 2292, Seq. ID No. 2294, Seq. ID No. 2296, Seq. ID No. 2304, Seq. ID No.  
2306, Seq. ID No. 2308, Seq. ID No. 2318, Seq. ID No. 2320, Seq. ID No. 2322,  
Seq. ID No. 2324, Seq. ID No. 2326, Seq. ID No. 2328, Seq. ID No. 2334, Seq.  
30 ID No. 2344, Seq. ID No. 2348, Seq. ID No. 2350, Seq. ID No. 2352, Seq. ID No.  
2354, Seq. ID No. 2356, Seq. ID No. 2358, Seq. ID No. 2366, Seq. ID No. 2390,  
Seq. ID No. 2392, Seq. ID No. 2408, Seq. ID No. 2420, Seq. ID No. 2422, Seq.  
ID No. 2428, Seq. ID No. 2430, Seq. ID No. 2434, Seq. ID No. 2450, Seq. ID No.

2460, Seq. ID No. 2490, Seq. ID No. 2498, Seq. ID No. 2504, Seq. ID No. 2508,  
Seq. ID No. 2516, Seq. ID No. 2524, Seq. ID No. 2526, Seq. ID No. 2532, Seq.  
ID No. 2536, Seq. ID No. 2538, Seq. ID No. 2542, Seq. ID No. 2544, Seq. ID No.  
2546, Seq. ID No. 2556, Seq. ID No. 2558, Seq. ID No. 2570, Seq. ID No. 2572,  
5 Seq. ID No. 2584, Seq. ID No. 2592, Seq. ID No. 2598, Seq. ID No. 2600, Seq.  
ID No. 2602, Seq. ID No. 2608, Seq. ID No. 2612, Seq. ID No. 2622, Seq. ID No.  
2630, Seq. ID No. 2652, Seq. ID No. 2680, Seq. ID No. 2694, Seq. ID No. 2702,  
Seq. ID No. 2704, Seq. ID No. 2706, Seq. ID No. 2708, Seq. ID No. 2732, Seq.  
ID No. 2734, Seq. ID No. 2784, Seq. ID No. 2786, Seq. ID No. 2814, Seq. ID No.  
10 2816, Seq. ID No. 2824, Seq. ID No. 2836, Seq. ID No. 2838, Seq. ID No. 2842,  
Seq. ID No. 2854, Seq. ID No. 2874, Seq. ID No. 2876, Seq. ID No. 2882, Seq.  
ID No. 2906, Seq. ID No. 2936, Seq. ID No. 2938, Seq. ID No. 2940, Seq. ID No.  
2942, Seq. ID No. 2948, Seq. ID No. 2950, Seq. ID No. 2970, Seq. ID No. 2974,  
Seq. ID No. 2978, Seq. ID No. 2982, Seq. ID No. 2988, Seq. ID No. 2992, Seq.  
15 ID No. 2996, Seq. ID No. 2998, Seq. ID No. 3006, Seq. ID No. 3008, Seq. ID No.  
3014, Seq. ID No. 3024, Seq. ID No. 3026, Seq. ID No. 3028, Seq. ID No. 3030,  
Seq. ID No. 3032, Seq. ID No. 3044, Seq. ID No. 3056, Seq. ID No. 3064, Seq.  
ID No. 3072, Seq. ID No. 3074, Seq. ID No. 3076, Seq. ID No. 3078, Seq. ID No.  
3124, Seq. ID No. 3146, Seq. ID No. 3156, Seq. ID No. 3158, Seq. ID No. 3164,  
20 Seq. ID No. 3184, Seq. ID No. 3194, Seq. ID No. 3202, Seq. ID No. 3214, Seq.  
ID No. 3216, Seq. ID No. 3218, Seq. ID No. 3220, Seq. ID No. 3242, Seq. ID No.  
3244, Seq. ID No. 3246, Seq. ID No. 3250, Seq. ID No. 3258, Seq. ID No. 3262,  
Seq. ID No. 3270, Seq. ID No. 3276, Seq. ID No. 3298, Seq. ID No. 3318, Seq.  
ID No. 3324, Seq. ID No. 3338, Seq. ID No. 3340, Seq. ID No. 3350, Seq. ID No.  
25 3352, Seq. ID No. 3354, Seq. ID No. 3358, Seq. ID No. 3360, Seq. ID No. 3378,  
Seq. ID No. 3390, Seq. ID No. 3392, Seq. ID No. 3396, Seq. ID No. 3406, Seq.  
ID No. 3422, Seq. ID No. 3426, Seq. ID No. 3450, Seq. ID No. 3452, Seq. ID No.  
3454, Seq. ID No. 3456, Seq. ID No. 3458, Seq. ID No. 3464, Seq. ID No. 3482,  
Seq. ID No. 3492, Seq. ID No. 3494, Seq. ID No. 3504, Seq. ID No. 3506, Seq.  
30 ID No. 3528, Seq. ID No. 3594, Seq. ID No. 3596, Seq. ID No. 3622, Seq. ID No.  
3626, Seq. ID No. 3636, Seq. ID No. 3680, Seq. ID No. 3724, Seq. ID No. 3728,  
Seq. ID No. 3746, Seq. ID No. 3754, Seq. ID No. 3756, Seq. ID No. 3758, Seq.  
ID No. 3762, Seq. ID No. 3764, Seq. ID No. 3766, Seq. ID No. 3784, Seq. ID No.

3794, Seq. ID No. 3800, Seq. ID No. 3814, Seq. ID No. 3838, Seq. ID No. 3840,  
Seq. ID No. 3850, Seq. ID No. 3852, Seq. ID No. 3854, Seq. ID No. 3860, Seq.  
ID No. 3862, Seq. ID No. 3864, Seq. ID No. 3866, Seq. ID No. 3880, Seq. ID No.  
3890, Seq. ID No. 3892, Seq. ID No. 3904, Seq. ID No. 3926, Seq. ID No. 3964,  
5 Seq. ID No. 3974, Seq. ID No. 3976, Seq. ID No. 4006, Seq. ID No. 4026, Seq.  
ID No. 4028, Seq. ID No. 4040, Seq. ID No. 4042, Seq. ID No. 4044, Seq. ID No.  
4046, Seq. ID No. 4048, Seq. ID No. 4062, Seq. ID No. 4072, Seq. ID No. 4074,  
Seq. ID No. 4080, Seq. ID No. 4082, Seq. ID No. 4084, Seq. ID No. 4102, Seq.  
ID No. 4104, Seq. ID No. 4112, Seq. ID No. 4134, Seq. ID No. 4138, Seq. ID No.  
10 4140, Seq. ID No. 4146, Seq. ID No. 4152, Seq. ID No. 4222, Seq. ID No. 4224,  
Seq. ID No. 4226, Seq. ID No. 4228, Seq. ID No. 4232, Seq. ID No. 4242, Seq.  
ID No. 4248, Seq. ID No. 4254, Seq. ID No. 4258, Seq. ID No. 4262, Seq. ID No.  
4308, Seq. ID No. 4312, Seq. ID No. 4314, Seq. ID No. 4344, Seq. ID No. 4380,  
Seq. ID No. 4386, Seq. ID No. 4390, Seq. ID No. 4440, Seq. ID No. 4470, Seq.  
15 ID No. 4474, Seq. ID No. 4482, Seq. ID No. 4484, Seq. ID No. 4486, Seq. ID No.  
4498, Seq. ID No. 4516, Seq. ID No. 4534, Seq. ID No. 4588, Seq. ID No. 4640,  
Seq. ID No. 4644, Seq. ID No. 4682, Seq. ID No. 4706, Seq. ID No. 4708, Seq.  
ID No. 4710, Seq. ID No. 4712, Seq. ID No. 4716, Seq. ID No. 4718, Seq. ID No.  
4738, Seq. ID No. 4760, Seq. ID No. 4814, Seq. ID No. 4828, Seq. ID No. 4870,  
20 Seq. ID No. 4872, Seq. ID No. 4874, Seq. ID No. 4876, Seq. ID No. 4920, Seq.  
ID No. 4932, Seq. ID No. 4950, Seq. ID No. 4952, Seq. ID No. 4988, Seq. ID No.  
5032, Seq. ID No. 5062, Seq. ID No. 5086, Seq. ID No. 5104, Seq. ID No. 5124,  
Seq. ID No. 5130, Seq. ID No. 5132, Seq. ID No. 5136, Seq. ID No. 5138, Seq.  
ID No. 5142, Seq. ID No. 5166, Seq. ID No. 5176, Seq. ID No. 5200, Seq. ID No.  
25 5206, Seq. ID No. 5208, Seq. ID No. 5214, Seq. ID No. 5220, Seq. ID No. 5224,  
Seq. ID No. 5268, Seq. ID No. 5282, Seq. ID No. 5386, Seq. ID No. 5388, Seq.  
ID No. 5414, Seq. ID No. 5416, Seq. ID No. 5434, Seq. ID No. 5454, Seq. ID No.  
5460, Seq. ID No. 5462, Seq. ID No. 5464, Seq. ID No. 5466, Seq. ID No. 5492,  
Seq. ID No. 5498, Seq. ID No. 5510, Seq. ID No. 5514, Seq. ID No. 5526, Seq.  
30 ID No. 5532, Seq. ID No. 5570, Seq. ID No. 5588, Seq. ID No. 5596, Seq. ID No.  
5598, Seq. ID No. 5610, Seq. ID No. 5612, Seq. ID No. 5622, Seq. ID No. 5624,  
Seq. ID No. 5634, Seq. ID No. 5638, Seq. ID No. 5644, Seq. ID No. 5650, Seq.  
ID No. 5660, Seq. ID No. 5684, Seq. ID No. 5686, Seq. ID No. 5700, Seq. ID No.

5706, Seq. ID No. 5710, Seq. ID No. 5730, Seq. ID No. 5734, Seq. ID No. 5764, Seq. ID No. 5766, Seq. ID No. 5768, Seq. ID No. 5772, Seq. ID No. 5784, Seq. ID No. 5792, Seq. ID No. 5798, Seq. ID No. 5886, Seq. ID No. 5890, Seq. ID No. 5894, Seq. ID No. 5896, Seq. ID No. 5900, Seq. ID No. 5902, Seq. ID No. 5906, Seq. ID No. 5910, Seq. ID No. 5922, Seq. ID No. 5924, Seq. ID No. 5928, Seq. ID No. 5940, Seq. ID No. 6028, Seq. ID No. 6044, Seq. ID No. 6048, Seq. ID No. 6060, Seq. ID No. 6068, Seq. ID No. 6090, Seq. ID No. 6092, Seq. ID No. 6108, Seq. ID No. 6112, Seq. ID No. 6118, Seq. ID No. 6162, Seq. ID No. 6164, Seq. ID No. 6166, Seq. ID No. 6170, Seq. ID No. 6184, Seq. ID No. 6186, Seq. ID No. 6190, Seq. ID No. 6192, Seq. ID No. 6198, Seq. ID No. 6204, Seq. ID No. 6206, Seq. ID No. 6210, Seq. ID No. 6222, Seq. ID No. 6224, Seq. ID No. 6226, Seq. ID No. 6228, Seq. ID No. 6230, Seq. ID No. 6236, Seq. ID No. 6238, Seq. ID No. 6244, Seq. ID No. 6246, Seq. ID No. 6250, Seq. ID No. 6254, Seq. ID No. 6264, Seq. ID No. 6266, Seq. ID No. 6274, Seq. ID No. 6276, Seq. ID No. 6286, Seq. ID No. 6290, Seq. ID No. 6302, Seq. ID No. 6304, Seq. ID No. 6364, Seq. ID No. 6378, Seq. ID No. 6382, Seq. ID No. 6384, Seq. ID No. 6416, Seq. ID No. 6428, Seq. ID No. 6432, Seq. ID No. 6474, Seq. ID No. 6498, Seq. ID No. 6572, Seq. ID No. 6582, Seq. ID No. 6594, Seq. ID No. 6600, Seq. ID No. 6632, and Seq. ID No. 6640.

20

56. An isolated polypeptide encoded by a polynucleotide comprising a nucleotide sequence having at least about 70% identity to a nucleotide sequence contained within SEQ ID NO: 6651, a complement thereof, a degenerate variant thereof, and a fragment thereof.

25

57. A recombinant expression vector comprising a nucleotide sequence having at least about 70% identity to a nucleotide sequence chosen from one of the odd numbered sequences set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a complement thereof, a degenerate variant thereof, and a fragment thereof.

30

58. The vector of claim 57, wherein the polynucleotide is selected from the group consisting of genomic DNA, cDNA, and RNA.



59. The vector of claim 58, wherein the polynucleotide comprises heterologous nucleotide sequences.
- 5 60. The vector of claim 58, wherein the polynucleotide is operatively linked to one or more gene expression regulatory elements.
- 10 61. The vector of claim 60, wherein the polynucleotide encodes a polypeptide comprising an amino acid sequence having at least about 70% identity to an amino acid sequence chosen from one of even numbered sequences set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, and a fragment thereof.
62. The vector of claim 57, wherein the vector is a plasmid.
- 15 63. A genetically engineered host cell, transfected, transformed or infected with the vector of claim 57.
64. The host cell of claim 63, wherein the host cell is a bacterial cell.
- 20 65. The host cell of claim 64, wherein the polynucleotide is expressed to produce the encoded polypeptide, a biological equivalent thereof, or a fragment thereof.
- 25 66. An antibody specific for a polypeptide encoded by an *Alloiococcus otitidis* polynucleotide chosen from one of the odd numbered sequences from SEQ ID NO: 1 through SEQ ID NO: 6649, a complement thereof, a fragment thereof, and a degenerate variant thereof.
- 30 67. An antibody specific for an *Alloiococcus otitidis* polypeptide chosen from one of even numbered sequence listings set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a complement thereof, a biological equivalent thereof, and a fragment thereof.

68. The antibody of claim 66, wherein the antibody is selected from the group consisting of monoclonal, polyclonal, chimeric, humanized and single chain.
69. The antibody of claim 67, wherein the antibody is selected from the group consisting of monoclonal, polyclonal, chimeric, humanized and single chain.
70. The antibody of claim 66, wherein the antibody is monoclonal.
71. The antibody of claim 67, wherein the antibody is monoclonal.
72. The antibody of claim 66, wherein the antibody is humanized.
73. The antibody of claim 67, wherein the antibody is humanized.
74. An immunogenic composition comprising a polypeptide having an amino acid sequence chosen from one of even numbered sequence listings set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a complement thereof, a biological equivalent thereof, and a fragment thereof.
75. The immunogenic composition of claim 74, further comprising a pharmaceutically acceptable carrier.
76. The immunogenic composition of claim 74, further comprising one or more adjuvants.
77. The immunogenic composition of claim 74, wherein the polypeptide is further defined as:
- (a) an *Alloiococcus otitidis* polypeptide predicted by SignalP algorithm analysis as having met all four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and predicted by HMM Signal P algorithm analysis as having a signal peptide;
  - (b) an *Alloiococcus otitidis* polypeptide predicted by SignalP algorithm analysis as having met three of the four criteria set out in the SignalP

- algorithm for a polypeptide having a signal peptide and predicted by HMM Signal P algorithm analysis as having a signal peptide;
- (c) an *Alloicoccus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as having a signal peptide;
- 5 (d) an *Alloicoccus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as being a non-secretory protein;
- (e) an *Alloicoccus otitidis* polypeptide identified by BlastP analysis;
- (f) an *Alloicoccus otitidis* polypeptide identified by Pfam analysis;
- 10 (g) an *Alloicoccus otitidis* polypeptide identified using proteomics methodology as sharing homology with surface exposed proteins of *Streptococcus pneumoniae*;
- (h) an *Alloicoccus otitidis* lipoprotein;
- (i) an *Alloicoccus otitidis* polypeptide having a LPXTG motif, wherein the polypeptide is covalently attached to the peptidoglycan layer;
- 15 (j) an *Alloicoccus otitidis* polypeptide, wherein the polypeptide is non-covalently associated with the peptidoglycan layer;
- (k) an *Alloicoccus otitidis* polypeptide having an RGD<sub>X</sub> motif wherein X is not a proline residue;
- (l) an *Alloicoccus otitidis* polypeptide predicted by BlastP as being involved in capsule biosynthesis and transport;
- 20 (m) an *Alloicoccus otitidis* polypeptide identified by BlastP as being localized within the capsule loci of the *Alloicoccus otitidis* genome;
- (n) an *Alloicoccus otitidis* polypeptide predicted by BlastP as being associated with sporulation;
- 25 (o) an *Alloicoccus otitidis* polypeptide encoded by unique ORFs identified by BlastP analysis as having a BlastP 'E Value' of  $> e^{-10}$ ;
- (p) an *Alloicoccus otitidis* polypeptide identified by Glimmer™ ORF finder program;
- (q) an *Alloicoccus otitidis* polypeptide identified by GeneMark™ ORF finder program;
- 30 (r) an *Alloicoccus otitidis* polypeptide identified by an ORF finder program that searches for an ATG, GTG or TTG start codon between a Stop-Stop region; and

- (s) an *Alloiooccus otitidis* polypeptide identified by an ORF finder program that searches for a transmembrane domain between two Stop codons and a Stop codon immediately upstream of this transmembrane region.

- 5 78. The immunogenic composition of claim 77, wherein the polypeptide further comprises heterologous amino acids.
79. The immunogenic composition of claim 77, wherein the polypeptide is a fusion polypeptide.
- 10 80. The immunogenic composition of claim 77, wherein the polypeptide is encoded by a polynucleotide comprising a nucleotide sequence having at least about 70% identity to a nucleotide sequence chosen from one of odd numbered sequence listings set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a degenerate variant thereof, or a fragment thereof.
- 15 81. The immunogenic composition of claim 80, wherein the polynucleotide further comprises heterologous nucleotides.
- 20 82. An immunogenic composition comprising a polynucleotide having a nucleotide sequence chosen from one of one of odd numbered sequence listings set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a degenerate variant thereof, or a fragment thereof and is comprised in an expression vector.
- 25 83. The immunogenic composition of claim 82, wherein the vector is plasmid DNA.
84. The immunogenic composition of claim 83, wherein the polynucleotide comprises heterologous nucleotides.
- 30 85. The immunogenic composition of claim 83, wherein the polynucleotide is operatively linked to one or more gene expression regulatory elements.

86. The immunogenic composition of claim 85, wherein the polynucleotide directs the expression of a neutralizing epitope of *Alloiococcus otitidis*.
87. The immunogenic composition of claim 86, further comprising one or more adjuvants.
88. A pharmaceutical composition comprising a polypeptide and a pharmaceutically acceptable carrier, wherein the polypeptide comprises an amino acid chosen from one of even numbered sequence listings set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a complement thereof, a biological equivalent thereof, and a fragment thereof.
89. The pharmaceutical composition of claim 88, wherein the polypeptide is further defined as:
- (a) an *Alloiococcus otitidis* polypeptide predicted by SignalP algorithm analysis as having met all four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and predicted by HMM SignalP algorithm analysis as having a signal peptide;
  - (b) an *Alloiococcus otitidis* polypeptide predicted by SignalP algorithm analysis as having met three of the four criteria set out in the SignalP algorithm for a polypeptide having a signal peptide and predicted by HMM SignalP algorithm analysis as having a signal peptide;
  - (c) an *Alloiococcus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as having a signal peptide;
  - (d) an *Alloiococcus otitidis* polypeptide predicted by HMM SignalP algorithm analysis as being a non-secretory protein;
  - (e) an *Alloiococcus otitidis* polypeptide identified by BlastP analysis;
  - (f) an *Alloiococcus otitidis* polypeptide identified by Pfam analysis;
  - (g) an *Alloiococcus otitidis* polypeptide identified using proteomics methodology as sharing homology with surface exposed proteins of *Streptococcus pneumoniae*;
  - (h) an *Alloiococcus otitidis* lipoprotein;

- (i) an *Alloiococcus otitidis* polypeptide having a LPXTG motif, wherein the polypeptide is covalently attached to the peptidoglycan layer;
- (j) an *Alloiococcus otitidis* polypeptide, wherein the polypeptide is non-covalently associated with the peptidoglycan layer;
- 5 (k) an *Alloiococcus otitidis* polypeptide having an RGD<sub>X</sub> motif wherein X is not a proline residue;
- (l) an *Alloiococcus otitidis* polypeptide predicted by BlastP as being involved in capsule biosynthesis and transport;
- (m) an *Alloiococcus otitidis* polypeptide identified by BlastP as being localized  
10 within the capsule loci of the *Alloiococcus otitidis* genome;
- (n) an *Alloiococcus otitidis* polypeptide predicted by BlastP as being associated with sporulation;
- (o) an *Alloiococcus otitidis* polypeptide encoded by unique ORFs identified by BlastP analysis as having a BlastP 'E Value' of  $> e^{-10}$ ;
- 15 (p) an *Alloiococcus otitidis* polypeptide identified by Glimmer™ ORF finder program;
- (q) an *Alloiococcus otitidis* polypeptide identified by GeneMark™ ORF finder program;
- (r) an *Alloiococcus otitidis* polypeptide identified by an ORF finder program  
20 that searches for an ATG, GTG or TTG start codon between a Stop-Stop region; and
- (s) an *Alloiococcus otitidis* polypeptide identified by an ORF finder program that searches for a transmembrane domain between two Stop codons and a Start codon immediately upstream of this transmembrane region.

25

90. The pharmaceutical composition of claim 89, wherein the polypeptide further comprises heterologous amino acids.

30

91. The pharmaceutical composition of claim 90, wherein the polypeptide is a fusion polypeptide.

92. A DNA chip comprising an array of polynucleotides, wherein at least one of the polynucleotides comprise a nucleotide sequence chosen from one of one of odd

numbered sequence listings set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a complement thereof, a degenerate variant thereof, and a fragment thereof.

- 5 93. A protein chip comprising an array of polypeptides, wherein at least one of the polypeptides comprises an amino acid sequence chosen from one of even numbered sequence listings set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof.
- 10 94. A method of immunizing against *Alloiococcus otitidis* comprising administering to a host an immunizing amount of an immunogenic composition comprising a polypeptide and a pharmaceutically acceptable carrier, wherein the polypeptide comprises an amino acid sequence chosen from one of even numbered sequence listings set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof.
- 15 95. The method of claim 94, wherein the polypeptide is a fusion polypeptide.
96. The method of claim 94, further comprising an adjuvant.
- 20 97. A method for the detection and/or identification of *Alloiococcus otitidis* in a biological sample comprising:
- 25 (a) contacting the sample with an oligonucleotide probe of a polynucleotide comprising the nucleotide sequence chosen from one of odd numbered sequence listings set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a degenerate variant thereof, or a fragment thereof, under conditions permitting hybridization; and
- (b) detecting the presence of hybridization complexes in the sample, wherein hybridization complexes indicate the presence of *Alloiococcus otitidis* in the sample.
- 30 98. A method for the detection and/or identification of *Alloiococcus otitidis* in a biological sample comprising:

- 5 (a) contacting the sample with an oligonucleotide primer of a polynucleotide comprising the nucleotide sequence chosen from one of odd numbered sequence listings set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a degenerate variant thereof, or a fragment thereof, in the presence of nucleotides and a polymerase enzyme under conditions permitting primer extension; and
- 10 (b) detecting the presence of primer extension products in the sample, wherein extension products indicate the presence of *Alloiococcus otitidis* in the sample.
99. A method for the detection and/or identification of *Alloiococcus otitidis* in a biological sample comprising:
- 15 (a) contacting the sample with an antibody specific for a polypeptide comprising an amino acid sequence chosen from one of even numbered sequence listings set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof, under conditions permitting immune complex formation; and
- 20 (b) detecting the presence of immune complexes in the sample, wherein immune complexes indicate the presence of *Alloiococcus otitidis* in the sample.
100. A method for the detection and/or identification of antibodies to *Alloiococcus otitidis* in a biological sample comprising:
- 25 (a) contacting the sample with a polypeptide comprising an amino acid sequence chosen from one of even numbered sequence listings set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof, under conditions permitting immune complex formation; and
- 30 (b) detecting the presence of immune complexes in the sample, wherein immune complexes indicate the presence of *Alloiococcus otitidis* in the sample.



- 5
101. A kit comprising a container containing an isolated polynucleotide comprising an nucleotide sequence chosen from one of odd numbered sequence listing set out in SEQ ID NO: 1 through SEQ ID NO: 6649, a degenerate variant thereof, or a fragment thereof.
102. The kit of claim 101, wherein the polynucleotide is a primer or a probe.
103. The kit of claim 101, wherein the polynucleotide is a primer and the kit further comprises a container containing a polymerase.
- 10
104. The kit of claim 103, wherein the kit further comprises a container containing dNTP.
- 15
105. A kit comprising a container containing an antibody that immunospecifically binds to a polypeptide comprising the amino acid sequence chosen from one of even numbered sequence listings set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof.
- 20
106. A kit comprising a container containing an antibody that immunospecifically binds to a fusion polypeptide comprising at least the amino acid sequence chosen from one of even numbered sequence listings set out in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof.
- 25
107. A method for producing a polypeptide, which comprises culturing the genetically engineered host cell of claim 63 under conditions suitable to produce the polypeptide and recovering the polypeptide from the culture.
- 30

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
12 June 2003 (12.06.2003)

PCT

(10) International Publication Number  
**WO 03/048304 A3**

(51) International Patent Classification<sup>7</sup>: **C07H 21/04**

(21) International Application Number: PCT/US02/36123

(22) International Filing Date:  
25 November 2002 (25.11.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/333,777 29 November 2001 (29.11.2001) US  
60/426,742 18 November 2002 (18.11.2002) US

(71) Applicant (for all designated States except US): **WYETH HOLDINGS CORPORATION** [US/US]; Five Giralda Farms, Madison, NJ 07940 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **FLETCHER, Leah, Diane** [US/US]; 25 Second Street, Geneseo, NY 14454 (US). **McMICHAEL, John, Calhoun** [US/US]; 186 Canterbury Road, Rochester, NY 14607 (US). **RUSSELL, David, Parrish** [US/US]; 240 North Pleasant Street, Canandaigua, NY 14424 (US). **ZAGURSKY, Robert, John** [US/US]; 569 Fox Hunt Drive, Victor, NY 14564 (US).

(74) Agents: **CALNAN, William, H.** et al.; Wyeth, Patent Law Department, Five Giralda Farms, Madison, NJ 07940-0874 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- with sequence listing part of description published separately in electronic form and available upon request from the International Bureau

(88) Date of publication of the international search report:  
11 December 2003

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ALLOIOCOCCUS OTITIDIS OPEN READING FRAMES (ORFs) ENCODING POLYPEPTIDE ANTIGENS, IMMUNOGENIC COMPOSITIONS AND USES THEREOF

(57) Abstract: The present invention relates to the complete genomic sequence of Gram-positive bacterium, *Alloiococcus otitidis*. The present invention also relates to polynucleotide sequences encoding polypeptides of *Alloiococcus otitidis*. In particular, the invention relates to antigenic polypeptides encoded by the *Alloiococcus otitidis* open reading frames (ORFs), and to their use in immunogenic compositions, therapeutics, diagnostics and the like.



**WO 03/048304 A3**

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/36123

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C07H 21/04

US CL : 536/23.7

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 536/23.7

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	STRATAGENE 1991 PRODUCT CATALOG, page 66 see random primer labeling kit.	1-11, 101-104,
X	EP 0786519 A2 (HUMAN GENOME SCIENCES, INC.) 30 July 1997, see entire document.	1-11, 57-62, 63-65, 82-87, 107
---		-----
Y		92
A	EP 0786519 A2 (HUMAN GENOME SCIENCES, INC.) 30 July 1997, see entire document.	15, 18, 27-29

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search

24 June 2003 (24.06.2003)

Date of mailing of the international search report

16 OCT 2003

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (703)305-3230

Authorized officer

Patricia A. Duffy

Telephone No. 703-308-0196

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/36123

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-11, 15, 18, 27, 28, 29, 57-65, 82-87, 92, 101-104, 107

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

**BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING**

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Groups 1-3325, claim(s) 1-31, 57-65, 82-87, 92, 101-104 and 107 (in part) drawn to separate polynucleotides and compositions as represented by the one of the odd numbered sequences from SEQ ID NO:1 to SEQ ID NO:6649.

Groups 3326-6650, claim(s) 32-56, 74-81, 88-91 and 93 (in part), drawn to to separate polypeptides and compositions as encoded by separate polynucleotides as represented by the one of the odd numbered sequences from SEQ ID NO:1 to SEQ ID NO:6649 or by one of the even numbered sequences from SEQ ID NO:2 to SEQ ID NO:6650.

Groups 6651-9975, claim(s) 66-73, 105 and 106 (in part), drawn to separate antibodies that bind polypeptides as encoded by separate polynucleotides as represented by the one of the odd numbered sequences from SEQ ID NO:1 to SEQ ID NO:6649 or by one of the even numbered sequences from SEQ ID NO:2 to SEQ ID NO:6650.

Groups 9975-13,300, claim(s) 94-96 (in part), drawn to separate methods of immunizing using materially separate polypeptides and compositions as encoded by separate polynucleotides as represented by the one of the odd numbered sequences from SEQ ID NO:1 to SEQ ID NO:6649 or by one of the even numbered sequences from SEQ ID NO:2 to SEQ ID NO:6650.

Group 13,300-16,625, claim 97 (in part), drawn to methods of detection by using separate probes from separate polynucleotides and compositions as represented by the one of the odd numbered sequences from SEQ ID NO:1 to SEQ ID NO:6649.

Group 16,626-19,950, claim 98 (in part), drawn to methods of detection by using separate primer pares from separate polynucleotides and compositions as represented by the one of the odd numbered sequences from SEQ ID NO:1 to SEQ ID NO:6649.

Group 19,951-23,275, claim 99 (in part), drawn to methods of detection using separate antibodies that bind materially separate polypeptides as encoded by separate polynucleotides as represented by the one of the odd numbered sequences from SEQ ID NO:1 to SEQ ID NO:6649 or by one of the even numbered sequences from SEQ ID NO:2 to SEQ ID NO:6650.

Group 23,276-26,600, claim 100 (in part), drawn to methods of detection using separate polypeptides as encoded by separate polynucleotides as represented by the one of the odd numbered sequences from SEQ ID NO:1 to SEQ ID NO:6649 or by one of the even numbered sequences from SEQ ID NO:2 to SEQ ID NO:6650.

The inventions listed as Groups 1-26,600 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: each of groups 1-26,600 are drawn to polynucleotides, polypeptides, antibodies, and methods of use thereof, that have different chemical structures as represented by their separate sequence identifiers as SEQ ID NOS:1-6650. Each sequence identifier possesses a different chemical structure and as such, each Group drawn to different sequence identifiers lack a corresponding technical feature with the other groups within the meaning of PCT Rule 13.2. Further, the technical feature of Group 1, with respect to a fragment of a polynucleotide is not special in that it does not define a feature that is novel over the art because the pNTPs and amino acids are sold by various chemical companies such as SIGMA. Therefore, each Group defines a separate technical feature.

# INTERNATIONAL SEARCH REPORT

PCT/US02/36123

## Continuation of B. FIELDS SEARCHED Item 3:

WEST, EMBASE, MEDLINE.

SEARCH TERMS: SEQ ID NO:1, VECTOR, HOST CELL, FUSION, RECOBINANT PRODUCTION, OITIDIS, ISOLATE, PURIFY, CLONE.